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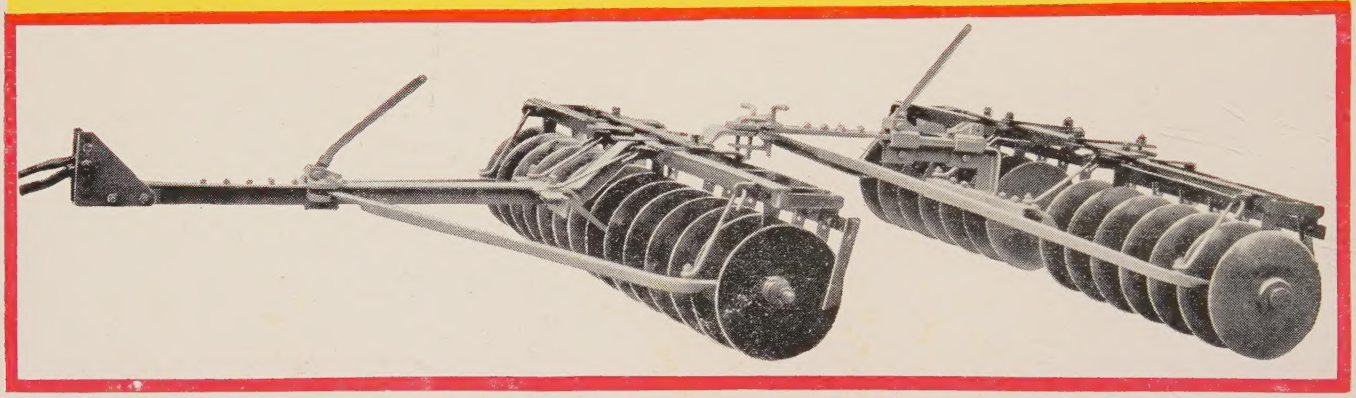

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New Zealand JOURNAL OF AGRICULTURE

PREVENTION OF HYDATIDS

By L. K. WHITTEN, *Parasitologist, Animal Research Station, Wallaceville.*

THOUSANDS of hydatids patients have been treated in the public hospitals of New Zealand, and every one of them contracted the disease from an undosed dog. Every year about a hundred cases are diagnosed and an average of twelve are fatal. In human beings hydatids may vary from a mild infection—which may persist for years and only be diagnosed after death has occurred from another cause—to an extremely severe disease calling for a number of major operations, each performed with the knowledge that such treatment is only palliative.

ABOUT half the sheep and cattle in New Zealand have hydatids, all caused by dog-spread parasites, yet this disease could be eradicated if all dogs were dosed with arecoline. ALL hydatid infections arise from dogs which have access to raw sheep offal, so the way to prevention lies in breaking the life cycle of the parasite at this point.

New Zealand, in common with other sheep-raising countries, is notorious for the high incidence of the disease in stock and human beings. It is most prevalent in countries where there are large populations of both sheep and dogs, the greatest incidence occurring in New Zealand, Australia, and certain South American Republics, particularly Argentina and Uraguay. It also occurs, though less frequently, in Europe, especially in Germany, France, Switzerland, the Balkans and Russia, in Syria and Palestine, in North Africa (Algeria and Tunisia), and in South Africa. Iceland was the classical home of the disease, but vigorous control measures appear to have reduced very greatly its incidence in that country.

Life History

Hydatid disease is caused by a cyst in one or more internal organs of the host. It passes its adult stage as a tapeworm in the small intestines of the dog. At this stage it is a flattened segmented worm about a quarter of an inch long, the head of which bears four round suckers and a double row of hooks by which it can attach itself to the gut wall. The body of the worm consists of three or four segments. Fresh segments are formed continuously by a process of budding from the neck region, and as the hindmost segment matures and becomes full of eggs it is shed and passes out with the excreta. The mature segment thus shed contains between 500 and 800 eggs. For some time it retains the power of movement, and is able to travel over the surface of the stool and even away from it and up neighbouring grass blades, leaving behind it a thin trail of infective eggs. When fresh the eggs are sticky and adhere to objects, but eventually are blown about in the wind.

The dust near dog kennels and the coats of the dogs become heavily contaminated, eggs are transferred to their mouths as they lick themselves or other dogs, and from these sources the majority of human cases originate. Infections are usually caused by soiled or "doggy" hands, and less frequently by contaminated food and drinking water.

The disease in stock comes mainly from the eating of contaminated pasture. Contaminated water is considered less important, as the egg is heavier than water and sinks to the bottom.

The egg of the hydatid parasite consists of a thick resistant shell enclosing a small embryo which is armed with three pairs of hooks. When the egg is swallowed by a suitable host—sheep, cattle, pigs, or man—the thick shell disintegrates under the action of digestive juices. The embryo thus freed burrows through the intestinal wall with the aid of its hooks and reaches the bloodstream, to be carried in it to the liver. There some of the embryos are arrested, while the remainder pass on to the lungs or other organs. The embyros are then attacked by white corpuscles and many of them destroyed, but survivors continue to grow. A small cavity is formed within each as it increases in size. From the inner layer of the cyst wall small bodies are budded off to increase in size and become hollow structures known as "brood capsules." Within the brood capsule a number of smaller bodies are budded off and eventually become tapeworm heads, each similar to that of the adult worm. Each head—of which there may be thousands in an average-sized cyst—is capable of becoming a separate worm if the cyst is eaten raw by a dog. Hydatid cysts in sheep may reach the size of a hen's egg, but in human beings much larger cysts are common, when their most serious effects are from pressure on adjacent organs.

The Disease in Man

The great majority of primary hydatid cysts in man involve the liver or lungs. Smaller numbers occur in the spleen, kidney, heart, brain, and bone. There is some evidence that most cases are contracted in early childhood and that symptoms are produced years later when the cyst, which as a rule grows very slowly, is a considerable size.

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(ESTABLISHED 1910)

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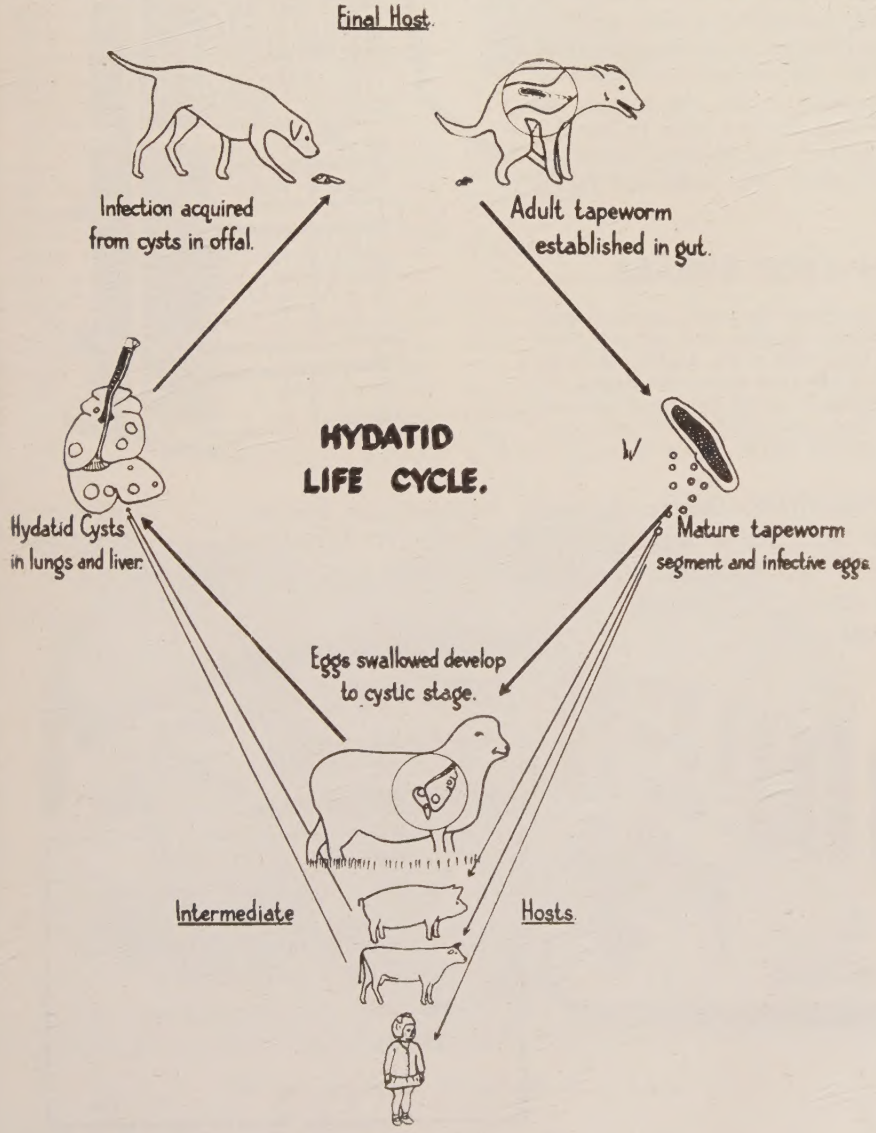
Hydatid cysts of the liver may be the size of a tennis ball and sometimes much bigger. They may rupture into the abdominal cavity spontaneously or following a blow. The sudden liberation of hydatid fluid may cause an allergic reaction varying from a mild attack of "hives" to sudden collapse and death. In non-fatal cases the liberated brood capsules may give rise to a crop of numerous secondary cysts in the abdominal cavity. Liver cysts may rupture into the gall bladder, in which case spontaneous cure may occur but more frequently the common bile duct becomes obstructed and jaundice follows. The rupture of small bile ducts, which allows the entry of bile into the cyst, may result in the death of the cyst or the production of a number of smaller daughter cysts within the cavity of the original cyst. Daughter cyst formation is a protective reaction characteristic of cysts which have been slightly injured.

Hydatid cysts of the lungs may rupture into a bronchial tube, in which case the patient may experience a flood of salty fluid into the mouth and so-called "grape skins"—which are in reality fragments of the cyst wall—may be coughed up. As with ruptured cysts elsewhere, spontaneous recovery or bacterial infection and suppuration may follow.

Diagnosis of hydatid disease can in many cases be confirmed by a skin or blood test or by X-ray. Treatment, however, is always by surgical measures.

Secondary cysts, from ruptured parent cysts in the liver or from "surgical accidents," always present a difficult problem. Small cysts are difficult to locate and remove, and failure to remove them means that further operations are required as soon as they become large enough to make their presence felt. Operations such as these may be necessary many times in severe cases of secondary hydatids.


Final Host.
Infection acquired from cysts in offal.
Adult tapeworm established in gut.
HYDATID LIFE CYCLE.
Hydatid Cysts in lungs and liver.
Mature tapeworm segment and infective eggs
Eggs swallowed develop to cystic stage.
Intermediate
Hosts.

Hydatids in Sheep

Hydatid disease is very common in New Zealand sheep. It is usually diagnosed only on slaughter, and even then small cysts are easily overlooked and small or degenerated cysts may be confused with several other conditions.

The incidence of hydatids increases with the age of the animal, not because older animals are more susceptible but because they have been exposed to the risk of infection for longer. By the time sheep are cast for age the cysts are big enough to be detected readily and identified even when they are deep in the liver or lung tissue. There is no evidence that lambs are less susceptible, but by the time lambs are slaughtered cysts are rarely more than an eighth of an inch in diameter; they may be overlooked or not recognised. In sheep about 90 per cent. of the cysts more than half an inch in diameter contain brood capsules, and there may be thousands in an average-sized cyst.

About a third of lamb livers are condemned for export; very few of them are definitely diagnosed as true hydatids—the majority are caused by a related parasite. In wethers, most of which are killed in their second or third year, the incidence of hydatid disease rarely exceeds 5 per cent. and affected livers usually show only one or two small cysts.

In ewes, on the other hand, which are usually slaughtered at a much greater age, the incidence may approach 100 per cent. and many large cysts may be present. It has been estimated that the value of livers condemned for hydatids each year in New Zealand is about £200,000.

Cattle and Pigs Less Important

Hydatid cysts in cattle are more frequent in the lung than in the liver. Lung cysts are usually single and filled with clear fluid, but in the liver a thick fibrous capsule is likely to be elaborated in the host, and rather than a single cyst developing, a number appear as a group of small cysts separated by thick strands of fibrous tissue. This greater reaction on the part of the host is a manifestation of a natural resistance in cattle, and in addition the fact that only 10 per cent. of cattle cysts are fertile indicates that the hydatid parasite is considerably less well adapted to development in cattle than in sheep. Cattle are not important as intermediate hosts because most cysts are sterile, and as little cattle slaughtering is carried out

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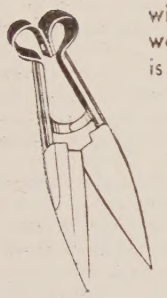

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on farms only rarely is infected offal available to dogs.

Hydatid disease in pigs is, in general, like that in other animals. The cysts are common in both the liver and lungs, but rather more frequently are generalised cases observed. In pigs a greater percentage of cases show cysts in the spleen and other organs, and occasionally in aged sows very spectacular cases of gross infestation are encountered. The pig is a much less important factor than the sheep in the spread of hydatid disease in most countries, though in Germany it is the most important intermediate host. The natural resistance of the pig is between that of sheep and cattle, and about 30 per cent. of the cysts in this host are fertile.

Cysts in Rabbits are not Hydatids

True hydatids do not occur in the rabbit, but two other cystic parasites are commonly found in New Zealand rabbits. Both are the larval stages of dog parasites. One form is frequently found under the skin of wild rabbits and may grow to about two inches in diameter; the multiple worm heads appear like sago grains in the cyst. The other parasite is found in the abdominal cavity as small cysts attached to the internal organs. Their life histories are similar to that of the hydatid except that only rabbits and dogs are involved. When dogs are fed on infected rabbits adult parasites develop in their intestines.

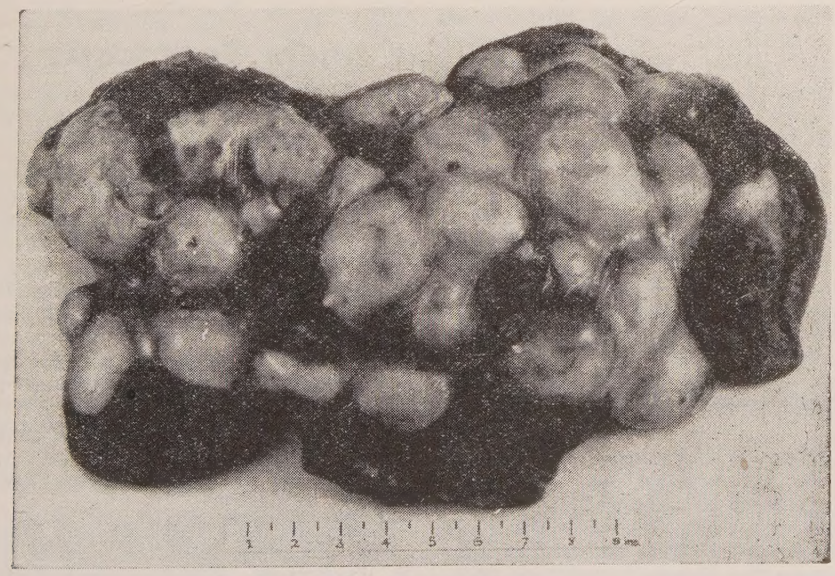
However, it is of less consequence if dogs are infected with these worms than with the hydatid parasite as they are harmless to human beings and livestock. These worms can be removed from the dog by the ordinary treatments, but it is advisable to inspect the carcasses of rabbits fed to dogs so that those obviously affected can be destroyed.

Prime cause of hydatids: The feeding of infected sheep offal to dogs.

Tapeworm in Dogs

The hydatid parasite which lives in the small intestine of the dog is so small that only very rarely is it detected in the field. Very large numbers may be present and be overlooked even by someone familiar with its appearance. There are, however, several other tapeworms frequently present in New Zealand dogs. Two of the largest ones are acquired from eating raw sheep offal or muscle. Two others similar in appearance have their cystic stages in the rabbit. There is also a smaller parasite characterised by the presence of segments shaped like cucumber seeds. This is probably the most common of all dog tapeworms, especially among city-bred dogs. The cystic stage in this case occurs in the body of the human flea, the dog flea, and the dog louse, and dogs become infected by swallowing parasitised insects.

There is little evidence that even very heavy tapeworm infestations are harmful to dogs, though some owners assert that an improvement in condition follows their removal. Some infected dogs tend to show signs of intense itching and drag their hindquarters along the ground in response to the irritation. They may also show signs of nervousness, restlessness, and irritability. Convulsions are sometimes attributed to heavy tapeworm infestations. It is known that tapeworms have high calcium requirements, and it has been suggested that they may precipitate calcium deficiency in dogs on a low calcium intake.



Massive infestation of hydatids in a liver.

Cats do not Spread Hydatids

Contrary to popular belief, the cat is of no importance in the spread of hydatid disease. Though the parasite will become established in the cat, it does not reach maturity and eggs are not produced. Furthermore, cats rarely have access to infected sheep offal and are cleaner in their habits than dogs, so that, even if the cat

could spread the disease, in practice it would be of only minor importance.

Treatment of Dogs

No attempt is ever made to treat hydatid disease in the intermediate host animal, but by the regular treatment of the dog harbouring the final stage the life cycle of the parasite can be very simply and effectively broken. Arecoline hydrobromide is the most satisfactory drug for the removal of worms from dogs. It is usually dispensed as small tablets each containing a quarter grain of the drug.

The simplest method of dosing is to dissolve the drug in a small quantity of water, pouring it into a pouch made by stretching the dog's cheek and allowing the dose to flow between the teeth and be swallowed. Some dogs become very cunning after repeated dosing; with such animals it may be necessary to use the tablets undissolved, placing them as far back on the tongue as possible or concealing them in a small piece of meat or fat. Before being dosed dogs should be starved for 24 hours.

Frequently dogs vomit after being dosed; efforts should be made to prevent this by holding their attention, by petting or speaking to them, or by tying them up so that they are unable to lower their heads. With dogs which have been dosed repeatedly and have become cunning, special care must be taken to prevent vomiting. Adequate purging may follow even when vomiting occurs within six or eight minutes of dosing. If the dog vomits before this time the results may be irregular and unsatisfactory, and treatment should be repeated several days later, or even on the same day, giving a slightly smaller dose.

Purging usually occurs between twenty minutes and an hour after dosing, but in some dogs the drug's action may be delayed for up to two hours. Exercise is often useful in accelerating the action of the drug, and some dogs may fail to purge until unleashed and allowed to run.

The first motion passed is usually solid and consists of the faeces already present in the lower bowel at the time of dosing. The second and subsequent stools are in general more fluid and contain the contents of the small intestine, together with the mucus and fluid secretion poured out by the gut wall in response to the drug; this portion will contain the majority of the parasites expelled. Care should be taken that the infective material passed by dogs after treatment is burned or buried. The majority of the worms expelled will still be immature and harmless, but large numbers of ripe segments may be present. This material may be an even more potent source of infection than an equivalent amount of faeces passed normally by an infected dog.

Arecoline hydrobromide, if used as directed, has a wide margin of safety. The doses usually recommended are:—

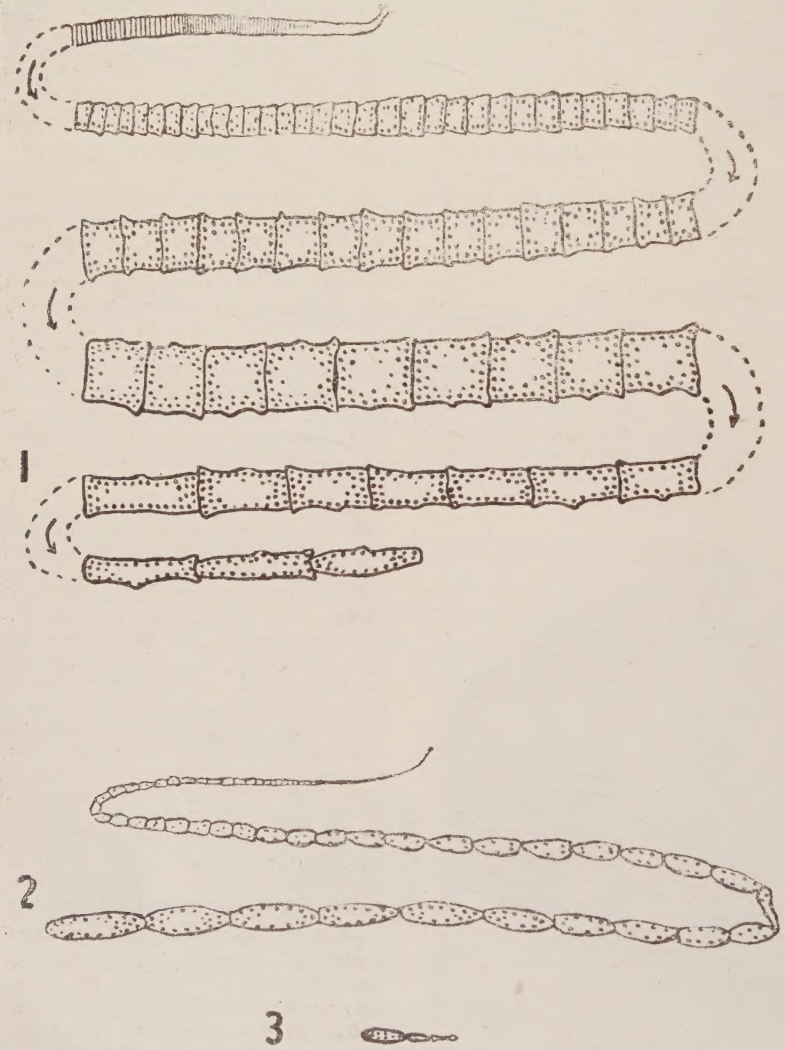
Toy dogs and puppies—½ tablet (⅛ grain).

Small breeds (fox terriers, Scottish terriers)—1 tablet (¼ grain).

Spaniels, border collies, etc.—2 tablets (½ grain).

Large collies, setters, hounds, retrievers, Alsatians—3 tablets (¾ grain).

The recommended doses remove very nearly 100 per cent. of the tapeworms present.



Adult tapeworms from the dog: 1 (natural size) and 2 (natural size) are related parasites; 3 (twice natural size)—the hydatid parasite—is the important one.

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

September 2—"Current Farming Problems," by E. B. Glanville, Instructor in Agriculture, Auckland, and P. S. Syme, Instructor in Agriculture, Warkworth.

September 9—"What Shall I Sow?" by K. M. Montgomery, Fields Instructor, Te Kuiti.

September 16—Talk on poultry by a Department of Agriculture poultry instructor.

September 23—"Young Farmers' Club Session," by a representative of the Western Bay of Plenty District Committee.

September 30—"Work of Soil Fertility Station at Hamilton," by R. E. R. Grimmett, Superintendent, Soil Fertility Station, Hamilton.

The purgative action of the drug is quite vigorous, and should it fail to occur after gentle exercise a further half dose may be given immediately or a full dose, increased slightly if necessary, may be repeated several days later. Treatment should be given four times a year.

There is a widespread belief, mainly based on hearsay, that arecoline is dangerous to dogs. Very few definite records exist of dogs having been harmed by the use of recommended doses. In a current field experiment 300 dogs have been dosed four times a year for three years and no untoward effects have been seen. It is clear that failure to dose dogs on these grounds is not justified, and there is a grave risk to human beings, especially young children, when there are untreated infections in so many of our country dogs.

Prevention

All hydatid infections arise from dogs which have access to raw sheep offal. Abattoir and slaughterhouse dogs are frequently infected but farm and station dogs are more important. Dogs which have access to offal from sheep killed for mutton or dog meat, or those which are allowed to eat carcasses of sheep dying on the farm, form a reservoir of infection both for grazing animals and for human beings who come in contact with them. Young children who fondle country dogs are most liable to become infected, especially if soiled hands and other objects are placed in their mouths, or when food is eaten without washing the hands thoroughly.

The most potent sources of infection for dogs are livers and lungs of aged ewes. Infected livers and lungs should be burned, deeply buried, or cooked by boiling for ten minutes. A practice which has been adopted by some farmers in Central Otago has much to commend it. A wire-netting sling is attached to poles 10 or 15 feet from the ground where sheep are slaughtered. The plucks are thrown into this sling, and allowed to dry out of reach of dogs. The danger of birds scattering the offal has in practice been negligible, and only a small effort is required by the farmer. In the dry climate of Central Otago the offal dries rapidly and the livers are soon tough and leathery so that maggot infestation and putrefaction are less evident than might be expected.

Important Precautions

The two most important steps in the prevention of hydatid disease are:—

1. **Regular treatment of dogs.**
2. **Elimination of reinfection by preventing dogs from eating infected livers and lungs of slaughtered animals.**

Supplementary precautions are:—

Dog kennels should be placed some distance from the house, milking shed, and vegetable garden. Kennels should be kept as clean as possible and excreta should be collected regularly and burned or buried. Dogs liable to infection should not be allowed indoors.

If possible rabbit carcasses should be fed to dogs, as rabbits are never infected with hydatids. It is also worth noting that meatmeal and pollard, with or without added fat to increase its palatability, form a very satisfactory diet. Dogs can thrive and work well on a diet made up solely of this mash if sufficient bones are provided to keep teeth and gums healthy.

Cooked ox spleens, which are usually still attached to the paunches when they are boiled for the preparation of tripe, form a safe and satisfactory diet for slaughterhouse dogs.

Flies have been shown to be capable of spreading the disease and measures to reduce their numbers should be adopted. Food and utensils should be protected by screens and covers.

Second essential in the breaking of the hydatids cycle: The regular dosing of dogs. Here is the correct method of administering the arecoline hydrobromide solution.

Children Susceptible

As young children are most susceptible to infection they should be taught the rudiments of hygiene as early as possible, in particular thorough washing of the hands after handling dogs. Washing before meals should be a habit. Young children should not be allowed to fondle dogs, especially farm dogs, in which this disease is most common. They should not be allowed to play near kennels, as the vicinity may be heavily contaminated. The humane destruction of aged and unnecessary dogs will reduce the risk of infection.

The application of these measures, and in particular the two primary rules of dosing dogs regularly and disposing of infected offal, should bring about a substantial reduction and eventually eradication of the disease in both man and animals.

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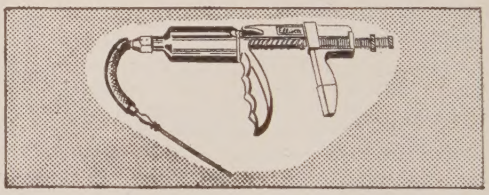

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SELECTIVE WEEDKILLERS

Experiments With a Variety of Crops

By P. B. LYNCH, *Crop Experimentalist, and* K. COTTIER, *Assistant Crop Experimentalist, Wellington.*

IN the past the only method of eradicating weeds in crop rows has been hand weeding, a time-consuming and laborious task. Selective weedkillers, which aim at destroying weeds in growing crops without injury to the crops themselves, are an alternative to this method.

SELECTIVE weedkillers are especially useful in row crops, in which the weeds growing in the rows are normally most difficult to deal with. For weeds growing between the rows inter-row cultivators have been developed and mechanised so that such weeds can be dealt with very economically. If selective sprays can be applied successfully, the saving is two-fold—in man-hours and in expenditure.

It should be emphasised that chemical weed control on row crops does not supersede inter-row cultivation. The two operations are complementary. Inter-row cultivation, from multiple-row outfits down to the wheel hoe, is the most economical means of dealing with inter-row weeds; chemical sprays will, in the future, probably be the best way of dealing with weeds in the row.

Choice of Time for Spraying

Chemical spraying can be carried out in conditions which would preclude mechanical cultivation—for example, during a wet spell of weather in which the ground becomes too saturated to permit working. During spring, when weed growth is prolific, chemical spraying in these circumstances could be the means of saving a crop which might otherwise be overwhelmed with weeds.

The success of spraying row crops will depend on whether the application is made at the most beneficial time. Carrots can be sprayed with power kerosene when the plants are showing two fern leaves. At this stage the weeds are also small (excluding abnormal weed growth) and it is possible to economise greatly with the kerosene, merely spraying a narrow band, with carrots in the centre. A complete weed kill can be obtained on 12in. rows with the use of 30 to 40 gallons of power kerosene per acre. The weeds not sprayed—those between the rows—can be dealt with by the inter-row cultivator.

This applies to other selective sprays. Applications at the right stage of weed growth, consistent with the resistant stages of the treated crop, will result in economy of time and materials, as well as giving a more satisfactory weed kill.

Selective weedkillers will probably have a place in crops which are broadcast or drilled so closely as to make inter-row cultivation impossible. Their use will be more expensive than with row crops because coverage of the area may have to be complete, though clearing up isolated weedy patches in such crops should not be expensive.

A case in point would be peas grown for canning in which black nightshade (*Solanum nigrum*) is present. This weed produces a berry similar in size to a shelled pea, bears fruit at the same time as the pea, and cannot be removed from the shelled peas by machinery. Selective spraying would be of value here. Many other such cases could be cited.

"Studies in Farm Management"

Apology is made for the absence from this issue of an article in the regularly-featured series "Studies in Farm Management." Next month the series will be resumed with "A Manukau Mixed Farm," by A. D. Mercer.

Work in Other Countries

A great deal of work has been done in other countries during the past few years, and as a result there have been produced selective sprays which may be used, apparently with success, on a number of valuable crops.

Some of these sprays depend on the use of dinitro-ortho-cresol, which is a chemical derivative of coal tar. Dinitro-ortho-cresol is insoluble in water, but some of its salts are soluble, and it is in the form of a salt that it has mainly been used. The sodium and ammonium salts in particular have formed the bases of several commercial sprays.

"Sinox" is such a spray, the effective principal being, to give its chemical name, sodium dinitro ortho cresylate. In view of the reported success attending its use in other countries, "Sinox" was used experimentally in several parts of New Zealand during the past two years under the direction of the Department of Agriculture. It is of interest to quote A. R. Raw, in the Journal of the Department of Agriculture, Victoria, concerning the selective action of "Sinox" spray.

> "Onion leaves are cylindrical, upright, and waxy, and in consequence the droplets of spray either run off or fail to penetrate to the vital tissues which form the new leaves. A similar structure is presented by the cereals and grasses which are also not affected by the spray. On the other hand, many weeds such as wild radish and hoary cress have flat leaves lacking a waxy surface, and frequently covered with hairs which retain the spray. Furthermore the leaves are set in a more or less horizontal plane, and the growing point is exposed, rendering it susceptible to the action of the spray."

Though "Sinox" may be used diluted with water alone, it has been found that its toxicity to weeds is increased by the addition of small quantities of sulphate of ammonia, which apparently activate the solution.

Experiments in New Zealand

The Fields Division of the New Zealand Department of Agriculture has conducted the following experiments:

Peas

Two experiments were undertaken with peas, both on the property of Mr. A. N. Webster, Tua Marina, Marlborough.

Experiment A: The solution used was 1 part of "Sinox" to 100 parts of water, applied at the rate of 100 gallons an acre. The peas at the time of spraying were 6in. high and the weeds 2 to 4in. high. These weeds were mainly wild turnip (*Sinapis arvensis*) and fathen (*Chenopodium album*), with some spurrey (*Spergula arvensis*) and grass. All weeds were killed with the exception of the fine-leaved spurrey and grass. Death occurred within two days of application, and

no further growth was in evidence four weeks later. The peas continued to grow vigorously. The remainder of the paddock, which was not sprayed, was harrowed twice for weed control, but effective control was not obtained as thoroughly as in the sprayed area.

Experiment B: Various concentrations of "Sinox" were used—1 in 80, 1 in 100, and 1 in 120. These were applied at the same rate of 100 gallons an acre. The peas were 8in. high, and the weeds, mainly wild turnip and fathen, varied from 6 to 10in. The effect of spraying with 1 in 120 and 1 in 100 dilutions was negligible, and the highest concentration of 1 in 80 had little effect, only withering the tops of the weed plants.

The negative results of experiment B were probably the result of the weed plants having attained too large a size. This had a two-fold effect: First, the weeds, being more mature and hardier, were able to withstand the chemical better than younger plants; second, the denser foliage presented by the larger weeds prevented effective spray penetration of the foliage.

A valuable point is thus demonstrated: Weeds can progress to a stage of growth where they cannot be effectively dealt with by weedicides.

Onions

Experiment A on Mr. D. Dewar's property, New Renwick Road, Marlborough: "Sinox" at a dilution of 1 in 100 was applied to onions in the one-leaf stage. The application proved lethal to both onions and weeds, the onion plants receiving a severe initial check from which 100 per cent. deaths occurred within a fortnight of the application.

Experiment B on Mr. L. Southey's property, Opiki: "Sinox" at a dilution of 1 in 100, with the addition of 1lb. of sulphate of ammonia to 100 gallons, was applied at 70 gallons an acre. It was a pre-emergence spray, as the onion seed, though germinating, had not emerged from the soil. Weed control was not good, and by the time the onions had emerged a further crop of weeds had appeared. The experiment became flooded shortly afterward and had to be discontinued.

Experiment C on Mr. A. Fell's property, Opiki: "Sinox" at a dilution of 1 in 100 was used, with the addition of 1lb. of sulphate of ammonia to 100 gallons, applied at 100 gallons an acre. It was originally intended to undertake a pre-emergence spray and a later application. Continued rain caused delay, and some of the onion seedlings were emerging at the time of the first spray. Five days after the application these onions were withered, though excellent control of weeds had been obtained, exceptions being Yorkshire fog, buttercup, and white clover, which resisted the chemical. Two weeks later those onion plants which were emerging at spraying were dead. The weeds killed by this application were hawkbit (*Leontodon hispidus*), black nightshade (*Solanum nigrum*), groundsel (*Senecio vulgaris*), dock (*Rumex obtusifolius*), sow thistle (*Sonchus oleraceus*), spear thistle (*Cirsium lanceolata*), and willowweed (*Polygonium persicaria*). Buttercup (*Ranunuculus repens*) showed a slight recovery from the weedicide.

When the onions left in the experiment had reached the three-leaf stage another similar application of "Sinox" was given. The onions were slightly burned on the tips but after a fortnight had made an excellent recovery. This spray was not necessary for weed control, as the previous application had been effective in that direction.

The onions treated with "Sinox" were superior to those in other treatments, which were sulphuric acid and hand weeding.

Leeks Sown for Transplanting

A solution of "Sinox" at 1 in 100 dilution, plus 1½lb. of sulphate of ammonia, was applied to leek plants sown for transplants. They were sprayed in the two-leaf stage with two rates of application, 50 gallons and 100 gallons an acre. The heavier application gave a good kill of weeds without injuring the leek plants. The action was prolonged, lasting several days. Large weeds were not completely killed, but received a severe check and recovery was slow. The lighter application killed small weeds, but the larger weeds began to recover after several days.

The weeds treated were: Willowweed (smartweed or spotted persicaria), fathen, shepherd's purse (*Capsella bursa pastoris*), spurrey or yarr, black nightshade or poroporo, narrow-leafed cress (*Lepidium ruderale*), broad-leafed dock, annual meadow grass (*Poa annua*), and narrow-leafed plantain (*Plantago lanceolata*).

Annual meadow grass was the only one of these not affected by the spray.

Onions near this trial were sprayed with "Sinox" while in the recently-emerged stage, but died off slowly after treatment.

Carrots and Onions

On Mr. J. J. Blackburn's property, Marshlands: "Sinox" was applied to onions in the three-leafed stage. Weeds were checked but not killed and eventually had to be removed by hand in the usual way.

Carrots were also sprayed, but results were poorer than those obtained in the same area with power kerosene. This was not an official experiment and details are lacking.

Hard Turnips

On Mr. W. B. Telford's property, Waiwera South: This was not an official trial and there is no record of the amounts used. The most obviously-affected weeds were spurrey, fathen, broad-leafed dock, sorrel (*Rumex acetosella*), Californian thistle (*Cirsium arvense*), and Scotch thistle (*Cirsium lanceolata*). *Poa annua* was little affected.

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The turnips themselves were affected, the leaves wilting and blotching white.

Effect on Linen Flax

The Agronomy Division, Plant Research Bureau, Department of Scientific and Industrial Research, conducted researches into the use of the sodium and ammonium salts of dinitro-ortho-cresol from 1941-42 to 1945-46. The main object was weed control in linen flax. "Sinox" alone, "Sinox" plus sulphate of ammonia, and "Amnox" (the ammonium salt of dinitro-ortho-cresol) were used. The conclusions reached were:—

1. Any of the three weedkillers can give highly satisfactory results.
2. Excellent control was obtained of fathen and black bindweed (*Polygonum convolvulus*), but no control of spurrey, sorrel, or wild oats (*Avena fatua*).
3. It is the quantity of weedkiller an acre, rather than the concentration applied, which is important: 20lb. "Sinox" an acre will give the same result whether dissolved in 80 gallons or 120 gallons. In practice 100 gallons an acre is a convenient application for power sprays.
4. The substitution of the ammonium for the sodium salt of dinitro-ortho-cresol, or the addition to the sodium salt of sulphate of ammonia, approximately doubles the toxicity and consequently halves the quantity required an acre.
5. The micro-climate within the crop itself at time of spraying is important. The relative humidity within the crop may remain high for several days after rain, even though the relative humidity reading of the atmosphere may be low. Under humid conditions damage to the flax may result from spraying. This danger is not present when humidity is low within the crop itself.
6. The margin between the minimum quantity required to kill weeds effectively and the maximum tolerated by flax is very narrow; therefore very exact control of spray delivery is of vital importance.

Summary of Experiments

1. The evidence shows that peas may be successfully freed of certain weeds by the use of "Sinox" at 1 in 100 dilution and applied at 100 gallons an acre. The size of the weeds when sprayed is of importance. The younger the weeds the more effective the kill.
2. Onions from emergence to the three-leaf stage are susceptible to damage from "Sinox," which at that period is lethal at 1 in 100 concentration applied at 100 gallons an acre.
3. "Sinox" at a 1 in 100 dilution with 1lb. of sulphate of ammonia added to 100 gallons of solution does not harmfully affect the ultimate growth of onions when applied at the three-leaf stage of growth at 100 gallons an acre.
4. Leek plants successfully withstand "Sinox" at a dilution of 1 in 100 with 1½lb. of sulphate of ammonia added to 100 gallons and applied at 100 gallons an acre.
5. Hard turnips cannot be sprayed with "Sinox" without damage to the crop.
6. Linen flax can be selectively sprayed successfully with "Sinox," "Sinox" and sulphate of ammonia, and "Amnox," but the crop is liable to damage under conditions of high humidity.
7. **Weeds known to be killed by "Sinox"** at concentrations in the vicinity of 1 in 100, with 1lb. of sulphate of ammonia to 100 gallons water, and applied at the rate of 100 gallons an acre, are:—Fathen, bindweed or cornbind, broad-leafed dock, wild turnip, groundsel, sow thistle, Californian thistle, spear or Scotch thistle, willowweed, shepherd's purse, black nightshade, narrow-leafed cress, and narrow-leafed plantain.
8. **Weeds not affected are:**—Grasses, *Poa annua* (the most common weed), spurrey, sorrel, and wild oats.

Precautions

Dinitro-ortho-cresol and its compounds so far used for spraying are relatively innocuous to operators. The usual precautions adopted with spray solutions should, of course, be followed. It is said that dinitro-ortho-cresol on drying out is highly inflammable, and for that reason containers should be kept air-tight. The substance leaves a yellow stain on the skin and clothing. It is inadvisable to allow stock on newly-sprayed areas.

As shown in experiments, dinitro-ortho-cresol sprays can be used with success for suppression of weeds in onions. Sulphuric acid has also been used with approximately equal results, but it is felt that, because of the dangerous properties of sulphuric acid, dinitro-ortho-cresol is to be preferred. Mishaps with sulphuric acid could easily occur, perhaps leading to permanent injuries to the operators. In addition the corrosive action of the acid on metals causes excessive deterioration of spraying equipment.

Costs of Spraying

An approximation of what spraying is likely to cost may be given as follows:

Under good conditions, where row crops 12in. apart are sprayed with knapsacks, and weeds are in the seedling stage, requiring the minimum dosage for destruction, one man can spray two acres in an eight-hour day. This means that the cost of labour for spraying would be 12s. to 15s. an acre, depending on the wage rate.

To this must be added the cost of the material used, plus incidentals such as cartage. The final figure is, nevertheless, considerably less than for hand weeding.

In the case of power spraying with multiple outfits it is probable that the cost would be even lower.

Acknowledgments

The experimental work has been made possible by the co-operation of farmers on whose properties the trials were carried out. The manufacturers' agents have made available the weedkillers for trial free of cost. The work of the Agronomy Division on linen flax is referred to, and the writers are indebted to the director for permission to use the results they have secured.

Show Dates

THE following agricultural and pastoral shows are scheduled on the dates and at the places shown:—

October 19—Ellesmere A. and P. at Leeston.
October 22, 23—Marlborough A. and P. at Blenheim.
October 23, 24—Hawke's Bay A. and P. Spring at Hastings.
October 26—Northern A. and P. at Rangiora.
October 30, 31—Poverty Bay A. and P. at Gisborne.
October 31—Ashburton A. and P. at Ashburton.
November 2—Timaru A. and P. at Timaru.
November 7, 8—Canterbury A. and P. at Christchurch.
November 8, 9—Manawatu A. and P. at Palmerston North.
November 15, 16—Wanganui A. and P. at Wanganui.
November 15, 16—Whangarei A. and P. at Whangarei.
November 16—Courtenay A. and P. at Kirwee.
November 22, 23—Nelson A. and P. at Nelson.
November 22, 23—Egmont A. and P. at New Piymouth.
November 23 — Otago Metropolitan Summer at Tahuna Park.
November 30—Winton A. and P. at Winton.
December 3, 4—Gore A. and P. at Gore.
December 7—Wyndham A. and P. at Wyndham.
December 7—Motueka A. and P. at Motueka.
December 10, 11—Southland A. and P. at Invercargill.

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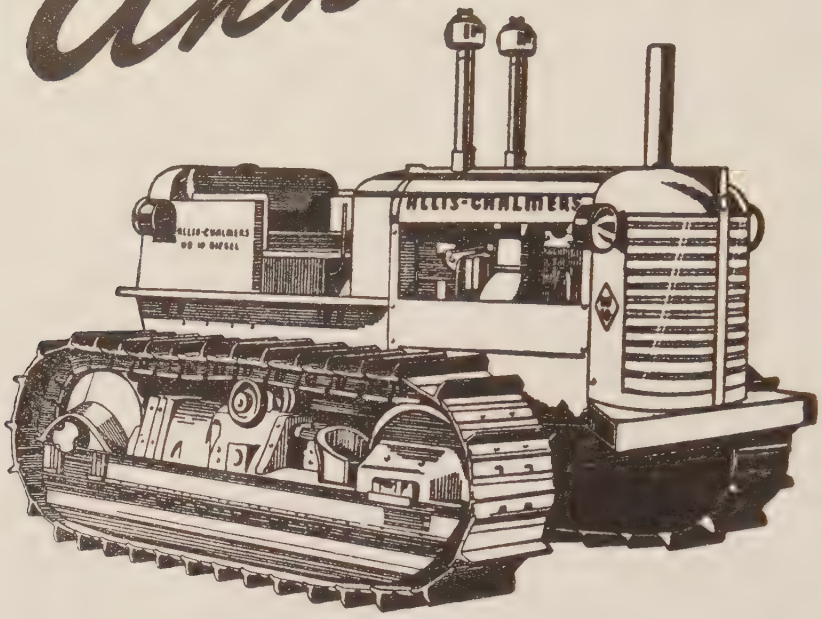

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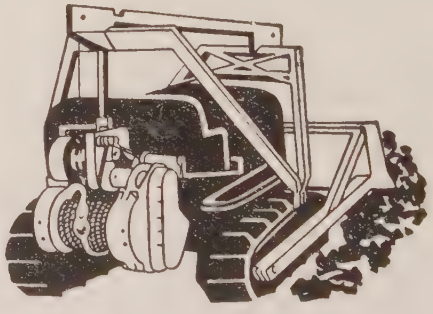

SPRING TOPDRESSING

By C. R. TAYLOR, *Fields Instructor, Rotorua.*

ALTHOUGH early autumn is the recognised time for applying the main topdressing to pastures, some beneficial results also follow the discreet use of fertilisers and lime in the spring. This article points to a few of the ways in which spring topdressing may be made a paying proposition.

WHEN fertilisers were in normal supply before the war, and farmers could order their requirements at will and obtain delivery on a more or less prearranged date, the demand for fertilisers for spring topdressing was practically negligible compared with that for autumn topdressing.

Several reasons could be advanced for this seasonal preference, but it is probable that the chief one was a fairly general reluctance on the part of the farmer to distribute fertilisers more than once a year—his contention being that since pasture growth was, in most instances, inevitable during the spring, summer, and early autumn, it was preferable to apply the annual topdressing at a time when it was likely to extend the season's herbage production as far into the low-production period (winter) as possible. Thus the autumn months of March and April became the most favoured time in the year for the topdressing of grassland by the majority of the Dominion's farmers.

To Counter Late Spring

Notwithstanding, however, the almost universal practice of autumn topdressing, there are many occasions when spring applications are also a distinct benefit to pasture production. Should, for example, a late spring be anticipated, as has often occurred in recent years, it is advantageous to topdress a few paddocks in August or September when growth begins to come away.

To secure the best results the pastures selected require a fair amount of clover in them, for it is on this species that phosphatic and potash fertilisers principally act, their effect on grass species being more indirect and less spectacular. Moreover, such pastures should be obviously growing and not grazed to excess, otherwise root action has not sufficiently developed to enable the best utilisation of the fertiliser applied.

Hay and Silage Fields

Hay and silage fields can also benefit from liberal feeding before being shut up in the spring. Early spring dressings of suitable fertilisers are most important if good yields of hay and silage are to be obtained and the deterioration of the pasture sward is to be guarded against, especially where circumstances necessitate the shutting up of the same paddocks for several successive years.

Autumn-sown Pastures

Spring topdressing also benefits young pastures sown down the previous autumn. Where these have been established under conditions of moderate to high soil fertility the need is admittedly not great, but on the lighter, poorer soil types, such as pumice country, a spring topdressing is almost invariably of such inestimable benefit to the establishing sward that it may be considered poor management to neglect applying it when available.

Lucerne and Cereals

A good dressing of phosphatic fertiliser in August or September will greatly benefit lucerne coming out of its dormant period and enable it to produce the maximum high-class fodder during the season. In some districts lucerne should also receive liberal applications of lime, in addition to any fertilisers applied, if the stand is to continue to thrive.

Autumn-sown cereals are also greatly helped in some districts by a light application of fertiliser following grazing off and spring cultivation, particularly if the crops are at this time oversown with red clover or temporary pasture mixture.

On lime-deficient soils little benefit will be derived from phosphate and potash manures unless the lime requirement is first applied. Many farmers are under the erroneous impression that the use of serpentine superphosphate largely does away with the need for lime on lime-deficient soils. While serpentine superphosphate strongly resists the soil fixation of phosphates which is common on some soil types, it does not supply generous quantities of lime as well.

BOOK REVIEW

"IT is officially agreed that vegetable oils are the outstanding world shortage, that this problem will become more acute as peacetime conditions return, and that we in this country [Great Britain] must be in a position to meet our own needs by home production," states E. F. Hurt in the foreword of his book "Sunflower for Food, Fodder and Fertility." The importance of vegetable oils and the main oil-producing crops and their countries of production are discussed.

As a utility crop producing vegetable oil, grain for poultry, cake for stock, cellulose, and organic matter for the soil, the sunflower, it is claimed, promises to rank highly important in Great Britain. The seed oil also has many commercial uses, such as in fine paints, soaps, and cosmetics.

Its introduction has, however, not been all plain sailing, and although grown on a field scale first in 1942, it was still in 1945 "the plaything of various interests—the agricultural seed trade, the bird seed trade, some earnest growers, and a number of spectators."

The growing of the crop varies little from standard methods for many farm crops, the real departure from standard practice in this country being the advice not to use artificial fertilisers unless laboratory tests indicate a very marked soil deficiency, for it is claimed that these reduce oil content. Early spring sowing is recommended; 10lb. of seed per acre being drilled in 18in. rows. Semi-dwarf varieties are used.

As with other crops, mechanisation has played a big part in the sunflower crop and harvesting is now carried out by direct heading. Previously the crop was hand-cut, stooked, and then threshed with the ordinary mill. Special attachments to the standard combines permit these machines to be used satisfactorily. Yield figures are somewhat vague—up to 30cwt. of seed per acre—but the opinion is expressed that a ton per acre should be a possible average. Unfortunately the usual pests affect the sunflower crop, which is also susceptible to such diseases as sclerotinia, botrytis, and other fungi.

Trials with sunflowers are to be undertaken in this country at an early date, but it may be difficult to work up much enthusiasm for a crop that may become a serious competitor to our staple animal-fat products.

—J.M.S.

"Sunflower for Food, Fodder, and Fertility": E. F. Hurt. Published by Faber and Faber, Limited, London. Price 10/6 net.

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NECTAR SECRETION IN CLOVER

Effect of Soil and Climate on Honey Production

By L. H. JOHNSON, *Apiary Instructor, Palmerston North.*

NECTAR gathered from white clover *(Trifolium repens)*, ripened and converted into honey by hive bees, is the mainstay of commercial beekeeping in most parts of New Zealand. White clover honey has a delicate flavour, is white when granulated, and is regarded as the standard of high quality by which all other honeys are graded.

BEARING in mind that the bulk of first-class honey harvested and marketed in New Zealand comes from clover, it may be interesting to outline briefly the conditions which increase or retard nectar secretion in certain localities. This survey, which includes districts on the west coast of the North Island from Wellington to New Plymouth where the atmosphere has a relatively high humidity, may not necessarily apply to other parts of the Dominion where the atmosphere is drier.

Though clover begins to flower in October and continues to bloom until the end of March, the main honey flow usually occurs about the second week in December and continues until the end of January—earlier or later according to location. Honey crop prospects cannot be estimated by the amount of clover blossom showing, but if nectar is not coming in freely by the end of January the prospects for a good yield are not very promising.

Climate and Soil

Climate and soil conditions which may promote an abundance of bloom are sometimes unfavourable for nectar secretion, so it is not always correct to assume that where there is clover bloom there is nectar. Clover is more sensitive to changes in temperature than possibly any other nectar-yielding plant. According to one authority, cool nights followed by warm days are better for nectar secretion than a uniform temperature. It is generally agreed that climate plays a major part in stimulating the secretion of nectar.

Well-sheltered clover pastures on flat land suitable for beekeeping.

High, undulating, clover-growing country.

Consecutive days of bright sunshine, warm day temperatures after a period of rain, and absence of wind, followed later by short periods of warm rain and sunshine, are the ideal weather conditions, but they are rarely experienced in all districts. Unfavourable weather for nectar secretion may be briefly described as short periods of sunshine followed by overcast skies, rain, cold snaps, and strong winds.

On the west coast of the North Island the main soil types important to beekeeping may be divided into seven groups—seabeach sand, river shingly loam, light volcanic ash, peat, pumice, clay, and papa. Though all these soils will grow an abundance of clover, rarely will all the pastures yield nectar abundantly at the same time. Not only the atmosphere but the ground must be warm.

Sandy Soils Yield First

Light, sandy soil, which is formed opposite beaches by the wind carrying beach sand inland for a few miles, extends along the greater part of the coast. This soil responds quickly to the heat of the sun and clovers growing on it yield nectar one or two weeks in advance of other localities. This area, which is near sea level, may be called early country and is also fairly reliable.

River-made shingly loam is also a warm soil, and, though limited in area, is nevertheless important to beekeeping. Stones or shingle will radiate the heat of the sun on to the nearby soil, having a similar effect to that which a bitumen road has on the secretion of nectar in a strip of clover growing alongside it. Pastures growing on shingle will not stand up to drought conditions, but where there is a copious spring rainfall in these areas clovers will yield nectar freely during the drying-out process.

Light volcanic ash soil, which occurs in both Taranaki Province and the King Country, is ideally suited for the growth of clover. Like sandy land, it is both porous and warm. Very good crops of honey have been produced off this soil.

Clay Soil Not Favourable

Clay soil or clay loam is not to be compared with the foregoing types for nectar yield. This soil is cold and much more retentive of water than other types, and a much longer period of warm, dry weather is needed before clovers growing on it begin to yield nectar. Better results

are obtained from this class of land where it is well drained, but unless the weather is consistently good during the spring and early summer, there is little prospect of a yield even if the weather does suddenly break fine in January. However, this class of soil will stand up to dry conditions better than light soils, and some seasons clover blooms well on it and yields nectar heavily. But as these conditions occur approximately once in seven years, the yearly average of honey production is not impressive.

Most of the areas well inland on papa or mudstone formation—which is undulating to hilly country with river flats, and separated by deep gorges—will grow clover in abundance, and may be considered to be better than clay soils. Good crops of nectar have been secured from clovers on this soil.

In Wellington and Taranaki Provinces there are considerable areas of drained swamp land which have been brought under cultivation. Though this rich, peat soil will promote a strong growth of luscious clover, only in very dry seasons will there be a heavy yield of nectar and for many seasons little if any honey is gathered. Appearances are very deceptive.

Clover grown on land with a pumice subsoil will yield very well except in very dry seasons.

Undulating Better than Flat Land

In addition to the part played by the soil type, it has been observed that undulating country is generally better for beekeeping than very flat land. Pastures which lie to the sun are warm, and the contour of the country will afford the bees flight lanes which are not windswept. Pastures in a warm, sunny valley sheltered from wind will usually yield two or three times as much nectar as open, windswept country.

Another condition worthy of attention is that some of the high tussock country well inland, after being brought under the plough, will grow clover reasonably well.

During midsummer the sun's rays are felt much more strongly at high altitudes because of less atmospheric dust. During this period there is a heavy honey flow of nectar which, though of short duration, is much better than that from some good pastures at lower altitudes.

Numerous wind breaks and small shelter trees have a beneficial effect on nectar secretion.

Dairy or Sheep Country

The old adage, "Dairy land only for honey production," may have prevented some beekeepers from placing their apiaries on good nectar-yielding pastures. It is not the amount of clover bloom showing but the amount capable of yielding nectar that is important. A good flow of nectar will usually come from the small, short clover in a warm soil where the pastures are fairly closely grazed; a heavy yield from a tall, rank growth of clover is rare.

Wind and Cloud

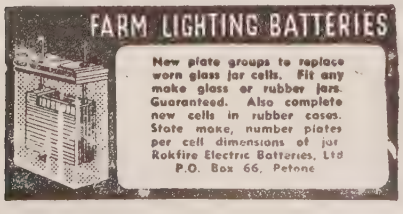
Coastal areas get more wind, more sunshine, and less rain than inland. Pastures are earlier, but often dry up quickly, and the wind causes considerable losses of field bees. Often during the clover blooming period, though the sun may be shining brightly, a keen wind will cut off the honey flow.

Cloud can also have a very serious effect on honey production. On one occasion a long tongue of heavy cloud hung over the Taranaki district, running from Mt. Egmont in a south-easterly direction, and remained there for several days. All colonies of bees in apiaries under the cloud not only gathered no surplus honey but drew heavily on their stores at a time when there was a good honey flow in other parts. Last summer, during the period of the main honey flow, a heavy cloud bank persisted over the area between the Manawatu River, the sea, and the Tararua Ranges, with the same result —colonies in the area affected gathered no surplus honey.

Drought conditions, which rarely occur in this district, seriously affect the yield from all pasture sources.

The beekeeper can directly assist his colonies by mapping out his bee territory, mainly on light soil, or arranging a chain of apiaries from coast to inland for variety of weather and soil types, thus ensuring honey crops measuring up to the yearly average, with a return from at least some apiaries during an adverse season.

Though a beekeeper may be aware of the basic principles of nectar secretion, he can be sure of how good or poor any particular territory is only by trying it out for at least two or three seasons. Surprisingly good crops can often be secured from unlikely-looking country.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Identical Twin Calves

IDENTICAL twin heifer calves are wanted for research purposes at Ruakura Animal Research Station, Hamilton. As identical twins possess exactly the same inherited factors, they must be very similar in most respects; especially the colour or colour shade of the coat must be very much alike in both calves.

Farmers in the Waikato, South Auckland, and Hauraki Plains areas who have twin heifer calves which appear to be identical are asked to communicate with the station by telephone (4790 Hamilton) or by letter (P.O. Box 432, Hamilton) giving their telephone number and full address. An officer will inspect the calves as soon as possible.

Selected calves will be bought at £2 a head, and 1s. 6d. a day per calf up to 10 days of age. If for some reason the calves are kept till a higher age, the price will be on agreement.

Pig Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in September as follows:—

Auckland—1YA, on September 18, at 7.15 p.m., "Care of Pigs in Summer Time," by F. Barwell, Supervisor, Bay of Plenty D.P.C.

Wellington—2YA, on September 17, at 7.15 p.m., "The Importance of Pasture for Pigs," by the Supervisor, Taranaki District Pig Council.

Christchurch—3YA, on September 19, at 7.15 p.m., "The Meat Inspector and the Supervisor," by H. McIntosh, Supervisor, Canterbury D.P.C.

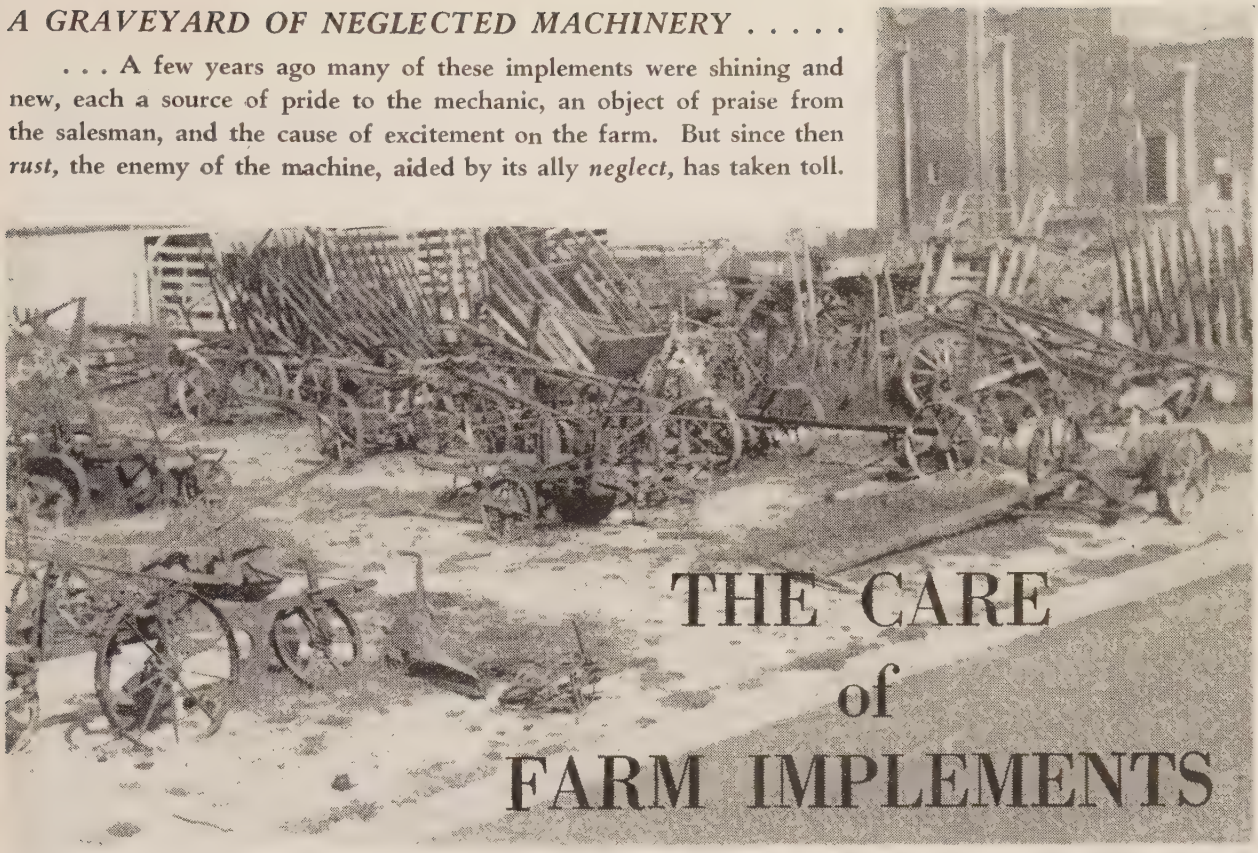
Napier—2YH, on September 10, at 7.15 p.m., "The Importance of Pasture for Pigs," by H. Hopkins, Tairawhiti D.P.C.

COOL STORAGE OF FRUIT

Refrigeration has proved essential for the distribution of fruit throughout the year. To obtain the benefit of modern improvements in refrigerated storage systems, a thorough knowledge of the methods of production, harvesting, and handling is necessary. These methods are discussed in Bulletin No. 257, "Cool Storage of Fruit," which deals fully with the construction of a fruit cool store, equipment and how it should be maintained, lighting, humidity, stacking methods, mould and fungi, and development of rots. Technical terms are explained simply and the bulletin gives apple and pear temperature charts. This bulletin may be obtained free from the Department of Agriculture, Auckland, Wellington, Christchurch, or Dunedin.

A GRAVEYARD OF NEGLECTED MACHINERY . . . . .

. . . A few years ago many of these implements were shining and new, each a source of pride to the mechanic, an object of praise from the salesman, and the cause of excitement on the farm. But since then *rust,* the enemy of the machine, aided by its ally *neglect,* has taken toll.



THE CARE of FARM IMPLEMENTS

By T. E. RODDA, *Fields Instructor, Hamilton.*

THIS article is not so much to remind the careful man what should be done in the care of farm machinery but to help and enlighten farmers who have not thought what wastage is occurring insidiously under their eyes, and help them to save valuable time at periods of the year when it is so urgently necessary to do so.

IT is lamentable to note wastage of farm implements and machinery through neglect. A common sight is a plough or a disc harrow, or even a grain and fertiliser drill, standing in the corner of a field where last used. The drill may have a sheet or two of corrugated iron or a few sacks placed over the top to prevent the water getting into the grain and manure hoppers, but otherwise there is no protection from rain and moisture drifting underneath and inside, and rust is allowed to carry out its work of destruction. Ploughs, discs, and harrows, both horse and tractor models, are sometimes left until the grass and weeds have completely hidden them from view, and much unnecessary loss of time and labour occurs in the search for them when next they have to be used.

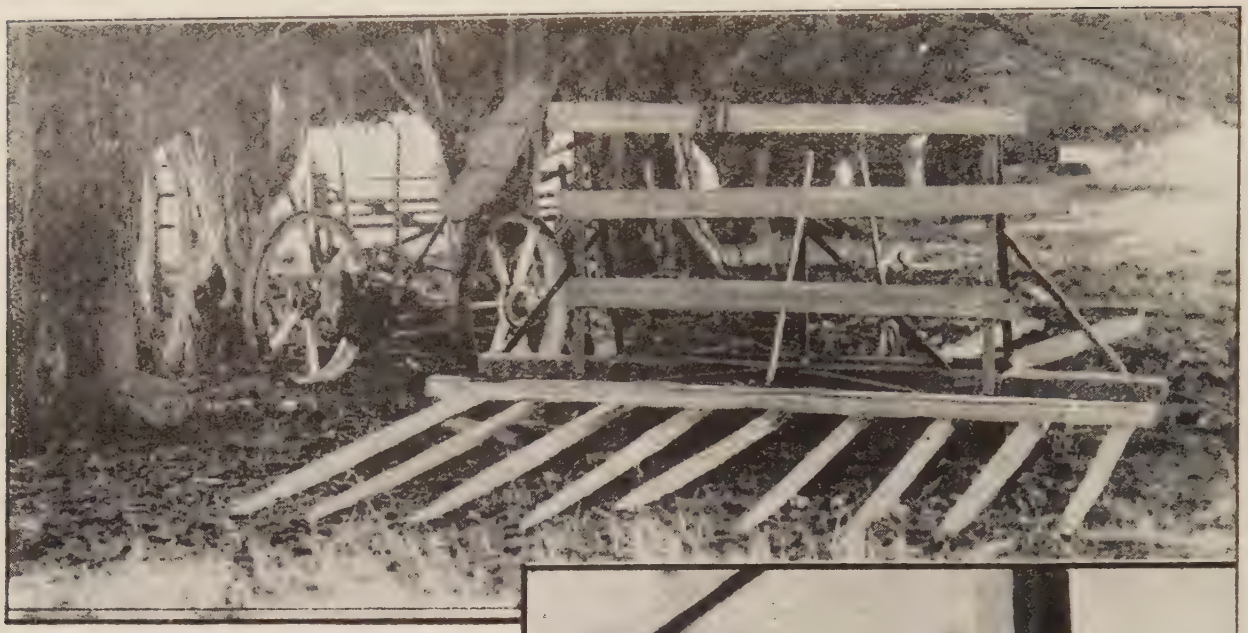
Surely valuable implements and machinery, generally so carefully designed and constructed, should receive better treatment and should always be ready to take the field when required An efficient and orderly farmer likes to see all farm implements and machinery placed away under cover in a neat orderly fashion when not in use.

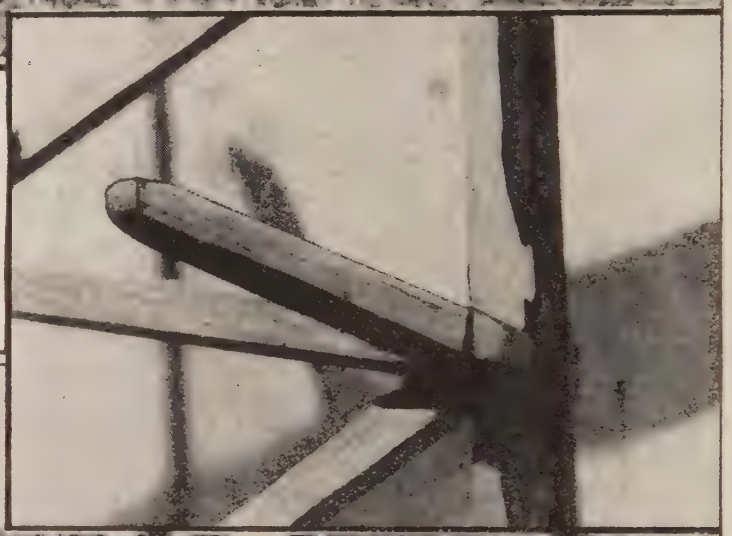
The Plough

Both horse-drawn and tractor model ploughs are well designed and built for the particular classes of work they are intended to do. It is not reasonable to expect a plough designed by its makers for ploughing free open land to work satisfactorily among stumps and timber, or land full of stones and boulders. Yet often heavy, rough work is attempted with a light plough and before the operator realises it the implement is badly strained or bent and rendered incapable of doing good work again until it has been thoroughly overhauled and readjusted by a competent plough setter.

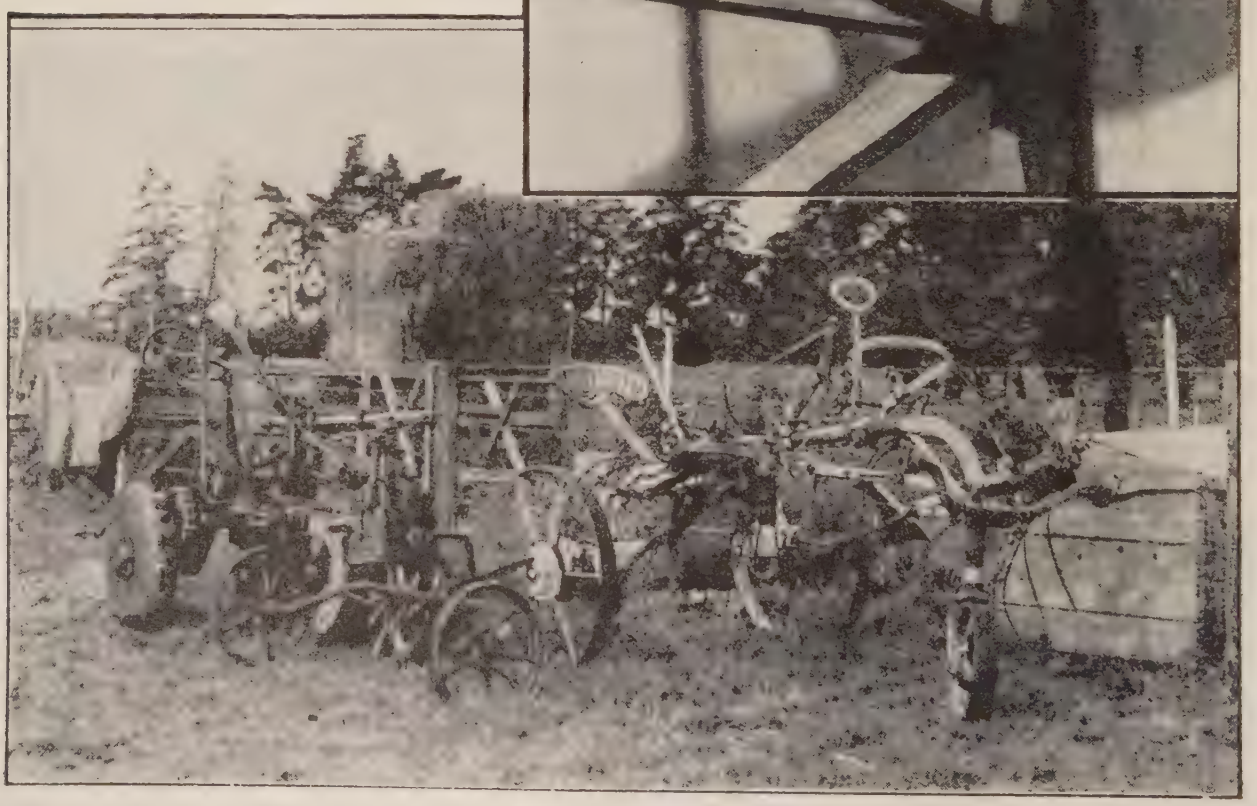
Even when worked with every care, a plough needs certain routine attention at the end of every working day. All moving parts should be oiled and greased according to the lubrication system provided by the maker. Make sure that the oil or grease is reaching the parts intended to receive lubrication. Sometimes dirt and sludge block the oil and grease feeding tubes and channels, and the rotating parts may run for a long time without receiving any lubrication. The result is a badly-worn shaft or bearing, or perhaps a broken part.

In spite of careful attention to regular lubrication, a certain amount of wear will, however, take place. The makers of most ploughs, especially tractor models, have made many provisions for adjustments to compensate for wear, and a careful check from time to time and the





Upper—Macrocarpa trees provide the only shelter for this tractor mower and tractor sweep since the last harvest. Middle—A harrow tooth that requires sharpening. Lower—Double-furrow tractor plough and swath turner lying in a corner of a cow paddock.



necessary alterations are amply repaid. The tightening of various nuts, the placing of an additional washer to take up slackness, and a little extra tension on certain springs all help to maintain rigidity of the structure and reduce wear.

When any ploughing job is completed do not leave the plough out in a corner of the field or alongside the road. If possible place it under cover, thoroughly clean all mouldboards and skeiths, and give brightly-polished parts a light coating of clean oil. Used tractor sump oil is quite good if it has been strained and kept in a covered tin or drum; but old oil that has been lying in an open tin around the shed for years is usually full of dust and grit, and when smeared on in a thick mass usually forms a tacky covering that is very difficult to remove from the mouldboards when the plough requires further use, especially if the soil is somewhat loose in texture and is not of a nature to scour the boards freely.

If the mouldboards are badly rust-pitted and have not been in use for some time, the following method of cleaning is recommended: Make a solution of 1 part of sulphuric acid and 10 parts of water. (Note: Measure out the respective quantities of water and sulphuric acid first, and add the sulphuric acid to the water, not the water to the sulphuric acid). Thoroughly swab the surfaces of the boards and start the plough immediately in firm ground. A second application of the solution may be necessary on badly-rusted boards. Light, shingly land or very sandy soils are ideal for cleaning mouldboards.

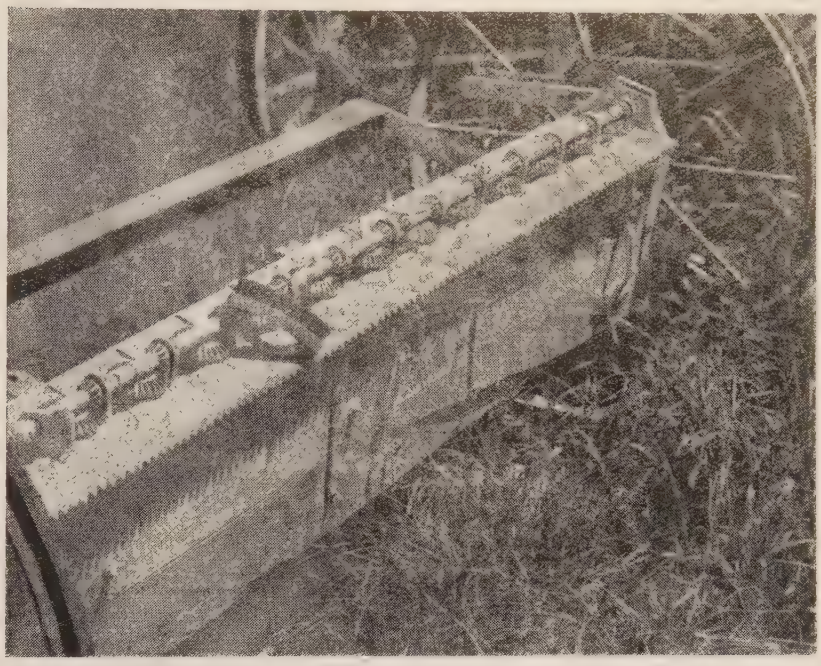
A good coat of paint applied every third year to the framework is one of the best insurances against rust.

Finally—never attempt to turn any plough at a right angle to the furrow without first lifting it out of the ground. It was never made for such treatment.

The Disc Harrow

The disc harrow is still a most useful implement and deserves more care and attention than it usually receives. Possibly the latest tractor models are better designed for efficient lubrication than other types and there should be no difficulty in keeping all bearings in good running order. A careful check must be made twice daily while the machine is in use to see that the whole lubrication system is functioning correctly. All nuts and bolts must be checked over occasionally to make sure that everything is tight.

Many drivers turn their tractors too sharply, placing too great a strain on the frame of the forward section and causing straining and bending of the stays and main beam. Such sharp turning is unnecessary and should never be practised. A little extra distance travelled on the headlands and sharp corners will very often save pounds in repairs.



Cleaning the under-gear of a topdresser. The machine is turned upside down and the bevel cogs thoroughly cleaned with a steel brush before being given a light coating of oil and placed under cover when topdressing is completed. A farm drill should be treated in a similar manner.

The Grain and Fertiliser Drill

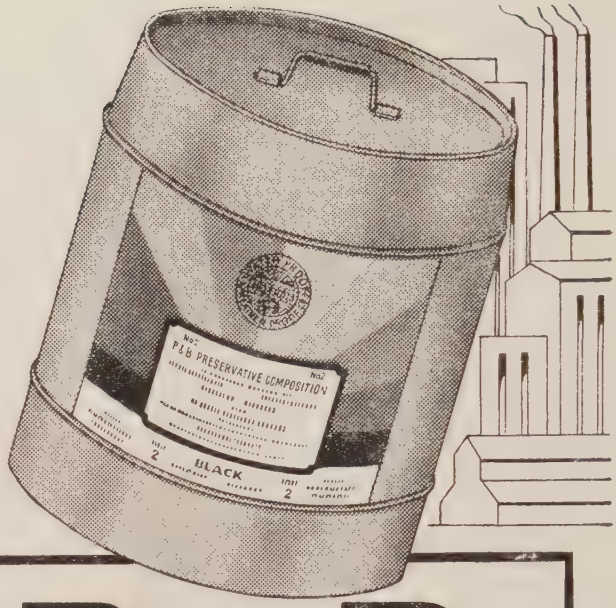
The grain and fertiliser drill is a fairly intricate and costly piece of machinery which is often subjected to considerable abuse and neglect. Some farmers who drill a fair annual acreage have kept their machines in running order for over 30 years, while machines of the same make in the hands of less careful farmers, though they have not sown anything like the same acreage, are fit only for the scrap heap in less than 12 years simply because they were never cleaned after use and were allowed to stand out in all weathers, or were merely placed under trees..

It must be remembered that as New Zealand has no great width at any part, the air is fairly heavily charged with sea salt, which has a very corrosive action on metals not specially made to resist such an atmosphere. This corrosion is further accentuated by fertilisers and it is imperative that the manure hopper of the drill should be thoroughly cleaned out every time a drilling job is completed.

One of the best methods of thoroughly cleaning the stars and manure runs after sowing straight superphosphate is to take out all the remaining fertiliser, thoroughly clean the tops of the stars with a steel brush similar to that used by painters, and then place a quantity of crushed limestone in the hopper. Place the machine in gear and drive ahead until the hopper is empty. The grinding effect of the lime passing through scours most of the adhering superphosphate out of the runways and enables the star feed gear to be lifted out readily, to allow the under surfaces of the stars to be thoroughly cleaned. If one wheel is jacked up and turned with the machine in gear the cogs underneath the hopper can be cleaned readily with the brush. Another way of getting at the under-gear is to fasten the lids of the grain and fertiliser boxes or hoppers securely and turn the drill upside down.

If any of the change feed cogs or other parts of the drill are becoming defective or badly worn they should be replaced immediately. If the job is put off the machine may be totally disabled in the middle of a large job that is really urgent. A coat of paint applied occasionally to all woodwork and metal framework will add years to the life of the machine.

Protect PLANT and EQUIPMENT *against* ACIDS, FUMES, DAMP, HUMIDITY



"P. & B." is a Preservative paint and a powerful adhesive in one. As a protection against chemical and atmospheric conditions and as an electrical insulating compound, this high-quality bituminous composition has been in service since 1884 . . .

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where humidity and milk acids threaten the efficiency of machinery and the life of vats, floors and buildings.

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"P & B."
the Super-resistant
PAINT
the Powerful, Fast-drying
ADHESIVE

Cultivators

The cultivator is one of the most useful implements for cleaning ground and conserving soil moisture during the summer. Various types and sizes are obtainable and are built with either rigid or spring teeth.

The most serviceable for the small farmer or the market gardener who is not growing crops in a large way is the single-horse type, usually used for intercultivating row crops. Single-horse machines by various makers are procurable, but one make is particularly useful for general purposes and can be used for all sorts of work. Used as a five-tooth machine by a capable operator it is particularly fitted for cultivating potatoes, peas, beans, mangolds, carrots, or swedes. The common practice with the majority of operators when cultivating seedling carrots, etc., is to leave the two side hoes or teeth in the normal scuffling position and to pull the machine in to its minimum width, leaving a broad band uncultivated and unstirred alongside the rows, thus aiding the establishment of seedling weeds, which cause a good deal of extra labour in hand weeding. On good makes of machines these side teeth may be turned semi-sidewise to turn the earth away so that the little plants are not covered as they would be if the teeth were set in the normal, straight-ahead position.

For the farmer cropping in a big way larger intercultivation implements are essential, and can be procured in both horse or tractor models. Great progress has been made in designing and perfecting tractor models during the last few years, and those designed for inter-row weeding and cultivation do remarkably good work if intelligently used.

The secret of success with all these new models of scarifiers and weeders is to make sure that they are properly fitted according to instructions issued with them, and to be careful not to use them for a purpose for which they were not intended. All parts not in use should be kept under good cover and should be well coated with clean oil before being placed away for the season.

The Tine Harrow

Apart from the plough the tine harrow was one of the first and most popular cultivation implements used by pioneer settlers, especially those in the North Island. In the very early days the usual practice after ploughing was to render the soil down to a tilth fit for planting by the use of harrows only. Disc harrows in those days were very rare, and in some districts quite unknown.

The usual practice was to give two or more strokes lengthwise with the

ABANDONED TO THE WEATHER

Upper—A farm drill left in the open, the only covering being two sheets of old iron. Middle—The only cover provided for this farm drill and cart. Lower—A hay-rake left standing alongside roadway since previous harvest.

furrow and then cross diagonally both ways, and then at right angles to the furrow.

Many of these sets of old tine harrows were made by the pioneers themselves. Usually a frame was made of some strong wood, composed of three 8ft. bars of 4in. x 3in. bolted to two crosspieces of 4in. x 3in. Peg teeth made of steel were placed about 8in. apart in the three 8ft. bars. These harrows did remarkably good work, the main trouble being that they were not flexible and would not touch the hollow places on hummocky land, and were a real problem to clean when they became jammed with rubbish. The all-steel zig-zag type of harrow made in leaves or sections, so familiar today, was a great improvement on the old home-made harrow.

The tine harrow may appear a very plain and simple implement which requires no experience or skill to use, but a lot depends on when and how the harrows are used. As a rule a set of harrows will do more effective work on stubborn working country such as heavy clay when the soil is dry enough to walk on without undue packing, and yet has not reached the stage when the surface clods have become cement-like, and will not break easily. The harrow is also a great surface leveller, and should be used wherever possible for evening up slight depressions and furrow finishes in a field.

Harrows need periodical attention to keep them in good working order and repair, the principal wearing parts being the points of the tines. These when sharp penetrate the soil and do good work, but after a time the points wear off and become very dull and work less efficiently. When the points have worn to approximately ½in. in diameter repointing should be done. All nuts should be kept well tightened to prevent movement and wear.

The Farm Cart

The farm cart, which used to be a very important item of farm equipment, still fills a place on the average small farm, although on the larger farms it is being superseded by the tractor trailer.

Cart wheels should be well protected from the sun during hot weather to prevent the tyres becoming slack. If no shed is available, the dray should be left in a shady place and the wheels covered with sacks or canvas. The wheels and all woodwork, including body and shafts, should be painted or dressed with linseed oil at least every third year. This is best done in the autumn when all timber is thoroughly dry.

The wheel axles should be well and regularly greased—a service neglected on many farms, with the result that axles wear quickly and the vehicle is much heavier to pull than it should be.

A certain amount of wear takes place usually on the lynch-pin end of the axle box, and on the inner face of the lynch-pin itself, especially if the dray is used frequently for carting sand or gravel. If this wear is allowed to go on unchecked, the cart will eventually begin to sway from side to side and make a great noise, owing to the wheel axles slipping from side to side in the axle boxes. This wear can be arrested and the swaying and noise considerably lessened by fitting a steel washer of suitable size and thickness on the axle at the back of the lynch-pin. In extremely bad cases it may be necessary to renew the lynch-pin as well.

Hydraulic Memoranda

1 gallon of water weighs 10lb.

1 gallon of milk weighs 10⅓lb.

1 cub. ft. of water weighs 62½lb (6¼ gals.)

1 in. of rain per acre weighs 100 tons (22,622 gals.)

Normal atmospheric pressure at sea level = 14.7lb. per sq. in., which equals a column of water 33.9ft. in height.

The practical lift of suction pumps is usually about 25ft.

A column of water 1ft. high exerts a pressure of .434lb. per sq. in.

To convert heads in ft. to lb. pressure multiply by .434, and to convert lb. pressure to ft. head multiply by 2.3. N.B.: No account in these calculations is taken of the frictional force of pipes, which in practice is of considerable importance, more especially with small diameter pipes. Normally ¾in. pipe should be used for farm water reticulation and the fewer the bends the better will be the flow.

Poultry Flock Improvement Plan

A BETTER understanding and appreciation of the aims and objects of the New Zealand Poultry Flock Improvement Plan is shown by the number of poultry flocks accredited for the 1946 season. Seventy-one flocks were accredited at the beginning of this year's breeding season, compared with 29 flocks in 1945. The increase can be regarded as both satisfactory and encouraging.

The following table sets out the number of applications received and withdrawn, flocks inspected, and flocks accredited in the four main provincial districts in 1945 and 1946:—

District.	No. of applications received. 1945.	1946.	No. of applications withdrawn. 1945.	1946.	No. of flocks inspected. 1945.	1946.	No. of flocks accredited. 1945.	1946.
Auckland	26	82	11	12	15	20	3	6
Wellington	48	69	21	10	27	59	13	41
Canterbury/Westland ..	10	13	2	1	8	12	3	6
Otago/Southland	13	19	2	1	11	18	9	18
Totals	97	133	36	24	61	109	28	71

One owner who has been granted accreditation of a hatchery undertakes to sell day-old chicks all of which have been hatched from eggs of accredited breeding stock. This is a clear indication that hatchery men, apart from owners of breeding flocks, can participate under the plan.

The 71 accredited breeding flocks total 14,838 breeding females, an average of 209 breeding females per flock.

The largest number of breeding females accredited on one farm is 1,440 for two breeds—White Leghorns and Australorps. There are 12 breeding flocks of Australorps accredited for 1946 compared with 1 in 1945.

Only five owners whose flocks were accredited in 1945 did not seek accreditation in 1946. Among these was the Government Poultry Station, Wallaceville, which has now ceased to operate. It was not possible for the new plant—the Poultry Demonstration Plant, Upper Hutt—to comply with the conditions of the plan for the current year, owing to difficulties associated with the complete reorganisation of the new and old plants. The main difficulty was that birds could not be weighed until well into the moulting period, when the weights recorded, including those of birds accredited in 1945, were below the minimum required by the plan. Although there was insufficient time to allow the birds to regain enough condition to accredit them, it was not considered desirable to discard them as many were known to be satisfactory breeding stock.

Application forms and copies of the conditions for accreditation in 1947 will be sent in due course to owners of accredited flocks.

CARE OF EWES AND LAMBS DURING LAMBING

LAMBING losses can be reduced considerably by intelligent care of the pregnant ewe, and sheep owners who anticipate disease before lambing is due to start will be spared the worry of curative treatments which, after all, are second-best to effective prevention. The use of vaccines to prevent diseases which recur annually, and the use of licks and topdressings to combat mineral deficiencies, are advocated by R. E. Alexander, M.R.C.V.S., Veterinarian, Gisborne, who also stresses the importance of cleanliness in castrating and docking operations.

PREGNANT ewes may be affected by bearing trouble or by sleepy sickness. The former complaint occurs about seven days before lambing, and if not promptly treated may result in death. The affected parts should be cleansed and disinfected, and the extruded membrane returned and retained in place by tying a few locks of wool across the opening. Outbreaks usually follow a mild winter when there is excess of coarse, bulky feed and the ewes are over-conditioned. Prevention consists in maintaining the ewes in gradually rising condition during pregnancy, with daily exercise and, if possible, a change of pasture.

Sleepy sickness or ante-partum paralysis is associated with a feed shortage occurring during the later stages of pregnancy. Healthy twin lambs are usually found in the womb. If the case is advanced nothing can be done as the liver is damaged, but in the early stages dosing with one or two ounces of Epsom salts and half a pound of molasses is worth trying. The molasses should be administered daily. The symptoms disappear if the ewe gives birth to the lambs.

Those owners who make a practice of vaccinating ewes to control pulpy kidney in lambs will give the animals two injections (5c.c. and 10c.c. respectively) with an interval of several weeks between. The second dose is given two or three weeks before lambing is due to start. The symptoms of the disease in lambs and their vaccination are referred to later.

Lamb Castration and Docking

Losses may result from excessive bleeding and wound infection. This latter trouble may be avoided by choosing a clean site as an operating theatre. As old yards are usually badly contaminated, a corner of a paddock should be enclosed with hurdles, netting, etc., from which the lambs can be returned straight to the paddock. They should be placed directly on their feet to avoid soil contamination.

All instruments should be boiled before use, and the operator's nails and hands should be clean. The choice of the method used is not important. Bloodless castrators, searing irons, and the knife all have their advocates, but experiment has shown that neither growth rate nor mortality is affected by the method used.

If infection has taken place, the first symptom usually noticed is arthritis or inflammation of the joints, the hip joints and the knees being the first affected. If generalised blood poisoning occurs, death may result very suddenly. Lockjaw or tetanus may be seen on farms where extensive cropping is practised.

Orphan Lambs

As ewe's milk contains more fat than cow's milk, orphan lambs should be fed milk rich in fat, or a little cream can be added. At the beginning it is important to feed little and often, commencing with two or three tablespoonfuls at frequent intervals. The utensils used must be clean and the temperature of the food should be about blood heat. At two or three weeks the lamb can be fed three times a day. At four weeks a little skimmilk can be added, and after six weeks some oatmeal porridge can be added to one feed. A small amount of crushed oats, bran, or meat meal can be fed dry or as porridge. Drinking water should be available, especially in hot weather, as lambs sometimes consume a considerable amount. It is a good plan to tie a bundle of hay to the fence.

Lambs should be weaned early on to clean, dry pasture, preferably previously grazed by cattle. Supplementary feed should be increased after weaning. Overstocking of young animals should be avoided. Clean areas are best obtained by closer subdivision of paddocks, rotational grazing, and the closing of paddocks in times of heavy growth for the production of hay and silage. In wet seasons early dosing for parasite control is advisable soon after weaning.

Black Lambs

The explanation of the appearance of a certain proportion of black or parti-coloured lambs is that originally all sheep fleeces were pigmented and white sheep are the result of domestication and controlled breeding. The occurrence of noticeably coloured sheep in station flocks is, however, very low. In 1942 it was about 0.04 per cent., and spots bearing black or brown wool occurred in over 5 per cent. of sheep. Probably a single pair of genetic factors control the situation. If a coloured animal is mated with a white sheep the offspring will be white, but if the offspring are mated some of their progeny will show pigmentation.

Dipping

Lambs ten weeks old or over may be dipped, and in some cases it is advisable, as parasites may be conveyed to them by the ewes. Unweaned lambs should not be dipped. When a flock is being dipped lambs come last in the order of dipping.

Diseases Affecting Lambs

Pulpy kidney, already referred to in connection with vaccinating ewes, is probably the most serious factor affecting lambing losses. The main loss occurs in lambs between the ages of three and six weeks, and varies from ½ to 5 per cent. The introduction of vaccination in 1937 has considerably reduced incidence of the disease. Where in certain districts the main loss occurs in old lambs or even in hoggets the lambs themselves can be vaccinated. Strict cleanliness should be observed when vaccinating. The Animal Research Station at Wallaceville recommends that if inoculating young lambs intended for export it is best to order "old type" vaccine, as the "alum-precipitated" variety is not suitable for animals soon to become carcasses.

Vaccination has also become invaluable in the treatment of scabby mouth or contagious ecthyma, a virus disease which particularly affects young lambs and weaners. Vaccinated lambs will remain immune for one to two years. The vaccine is supplied by the Animal Research Station, Wallaceville. Extra handling is avoided if the vaccine is used at marking time.

The main symptoms of the disease are scabs round the lips and muzzle. There is usually some swelling of the parts and a nasal discharge. If the scabs are pulled away, they leave a raw, bleeding surface.

The presence of thistles in the pasture is often the predisposing cause. The lambs are attracted by the fresh growth at the root of the thistle and their muzzles are punctured by the spines, thus permitting the entry of the virus. In severe cases the scrotum or the feet may be affected. The

general health is not affected but there is loss of condition. Treatment consists of bathing the parts with a solution of Condy's crystals, afterwards applying boracic ointment or powder. The lambs should be transferred to a clean pasture.

The disease known as blackleg may follow the docking of lambs. Affected animals are usually found dead, but if observed while still alive they may be seen to be standing apart and breathing rapidly. Recovery is very rare. The carcasses should be buried deeply or burnt. Where annual losses recur vaccination can be carried out in this case also.

Occasionally cases of goitre in lambs are reported. Of some cases observed in Dunedin in September, 1941, a few affected lambs were born prematurely, a few were born dead, but the majority were born alive with very little vitality. The thyroid gland in the normal animal is dark red in colour and lies on each side of the first six or seven rings of the windpipe. The lobes are about 2in. long. In these cases the glands varied from the size of a filbert nut to as big as a large duck egg, and one lobe was usually larger than the other.

Some years ago glands from fat lambs were examined for iodine content, and it was found that areas of medium iodine content occurred about the Te Karaka district of Poverty Bay, Hawke's Bay, and between Wellington and Waverley. Areas of low iodine content occurred around Hastings, Waipukurau, Shannon, and Wanganui. In such areas iodine should be provided in the form of a lick at the rate of 4oz. of potassium iodide to the ton of lick. It has been said that New Zealand and Switzerland are the two most iodine-deficient countries in the world.

Cobalt deficiency, which characterises the pumice areas and to which weaned lambs are most sensitive, must also be overcome. Cobalt sulphate may be obtained from the Department of Agriculture with full instructions for drenching, or it may be incorporated in licks or applied as cobaltised topdressing to the pastures. Affected lambs show general unthriftiness.

Rickets is defined as a derangement of calcium metabolism in growing animals in which the newly-formed bony tissue fails to calcify or become hardened with lime. As far as is known true rickets occurs only in hoggets in Canterbury and Otago. But a condition known as "bowie" (where the lambs show bandiness of the forelimbs) has been described in young lambs in Marlborough and parts of Canterbury and Otago.

In parts of the Hauraki Plains and the Manawatu a condition known as osteoporosis in suckling lambs has been noted. Affected lambs are prone to develop fractures of the limb bones and ribs. No doubt there are other variations in different districts, and treatment would differ accordingly. The main preventive is an adequate supply of the essential minerals such as calcium and phosphorus; and vitamin D. These are normally present in good, mixed pastures subjected to lime and phosphatic topdressing practice. The cases of true rickets referred to have, however, mainly been noted when young sheep are being raised on green oats or other arable crops. Such crops may be defective in their mineral content as compared with good, mixed, permanent pasture.

Bottle Type Feeder for Feeding Bees

By D. S. ROBINSON, *Apiary Instructor, Hastings.*

A SIMPLE and efficient type of feeder especially useful for feeding weak colonies or nuclei, in cases of emergency when combs of honey are not available, may be made as follows:

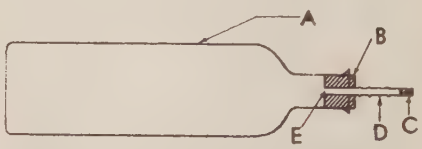
A quart bottle with a good sound cork is required. Drill a $\frac{3}{8}$in. hole through the cork and insert a $\frac{3}{8}$in. metal tube (about 6in. long) so that one end is flush with the end of the cork, as illustrated. Plug the opposite end of the tube and drill six or eight small holes about $\frac{1}{8}$in. in diameter in the tube. The feeder is now ready for use.

To use: Place an empty super over the brood chamber of the hive, fill the bottle with sugar syrup, and place it over the cluster of bees with the tube pointing downward at an angle of approximately 30 degrees, which allows the bees to take in the syrup through the holes in the tube. Moderate feeding is thus accomplished.

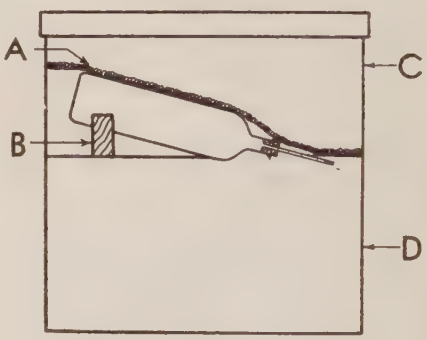
The bottle is held in position by placing it on a block of wood of the required height with a nail driven in each side of the block to prevent movement, or may be placed on a block cut to shape as shown in the illustration. A good mat should be placed over the feeder. This bottle-type feeder is easily kept clean, so there is little danger of the syrup fermenting.

An added advantage is the comparatively small amount of syrup exposed in a position where the bees can readily collect it without danger of robber bees being attracted.

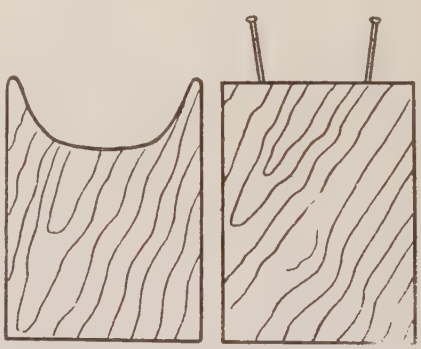
Acknowledgment is made to Mr. C. Fafeita, Eketahuna, for bringing this class of feeder to the writer's notice.



Details of the feeder: A bottle, B cork, C plug, D holes drilled in a 6in. tube, E end of the tube flush with the cork.



The feeder in position: A matting, B wooden block, C empty super, D brood chamber.



Wooden block hollowed or with nails to support the bottle.

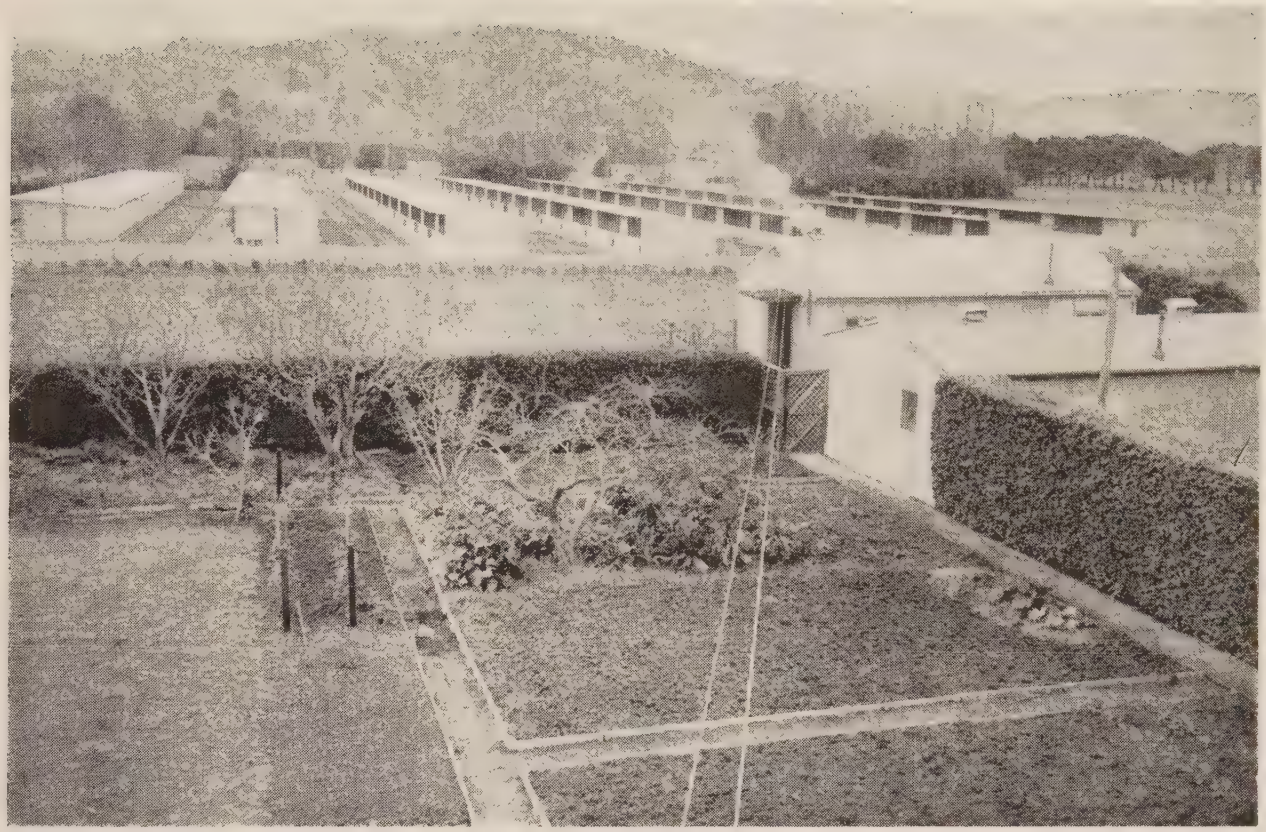


Table Poultry Plant, Upper Hutt

REORGANISATION AS A DEMONSTRATION PLANT

By F. C. BOBBY, *Superintendent of Poultry Husbandry, Wellington.*

THE Table Poultry Plant, Upper Hutt, established as a wartime project to supply small table chicken to the United States Joint Purchasing Board, has served its purpose and no longer exists in its original form. It is being reorganised on a peacetime basis to serve the poultry industry as a Poultry Demonstration Plant. With the birth of this new plant comes the end of the Poultry Station, Wallaceville, which has served the industry for more than 20 years. The old station is being dismantled and transferred to the new property in Upper Hutt.

TABLE poultry production has never been a major aspect of poultry husbandry in New Zealand. Rather has it been confined to the sale of surplus cockerels during the normal rearing season and the disposal of unwanted laying birds at the end of their production period. Little attention has been paid to premises where poultry are slaughtered, and methods of processing table birds may be described in general as crude compared with those employed by other poultry-producing countries.

Requested by U.S.J.P.B.

That was the position in 1943 when the United States Joint Purchasing Board (U.S.J.P.B.) enquired for supplies of table birds for their hospitals and convalescent camps in the Pacific area. The board required young chickens in regular consignments throughout the year. Moreover, it required that these birds be killed, processed, and graded to American standards for table poultry. The board met difficulty in obtaining its requirements in regard to both quantity and quality, so the New Zealand Government was approached with a request that a table poultry plant be established without delay.

That request was received officially on July 10, 1943, and by the beginning of September a property suitable for the purpose had been found near Upper Hutt. It was a small dairy farm of 15½ acres, having a good dwelling house, a double-storey food store, a concrete-walled store, and a garage. Additional advantages were reasonably flat paddocks suitable for large poultry house construction, and close proximity to the main road and station. Plans of a plant capable of producing 1,000 table chickens a week were drawn up immediately and a contract let for erecting the poultry houses. As the company concerned had not previously undertaken a contract of this kind, it was essential that close co-operation should exist between the company and officers of the Department of Agriculture. Many small details of poultry house construction had to be watched. Speed was an essential factor and work proceeded seven days a week.

The fact that the first small batch of birds was transferred to the new plant from the Poultry Station, Wallaceville, during the first week of January, 1944, indicates the speed with which the project was developed. Apart from the erection of poultry housing, sites had to be levelled, roads made, and services such as water and power laid on. That work was undertaken by the Public Works Department. Close co-operation between all concerned ensured the speed of construction requested by the U.S.J.P.B.

Lay-out of the Plant

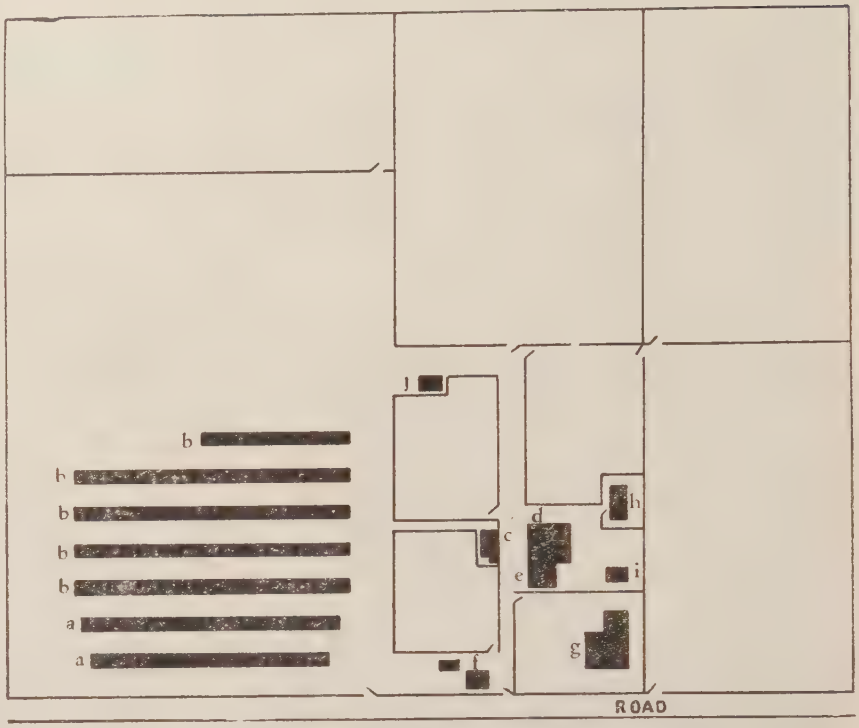
The plan of the plant and the photograph in the heading show the general lay-out. The major group of poultry houses (on the left of the plan) was used for brooding (a) and growing (b) the chickens. In total they had a floor space of 33,000 square feet, and the average length of each house was 336ft. No grass runs were attached to these houses, the birds being run intensively throughout their lives. Behind each house is a plot of cultivated ground on which green food was grown, and the roads serving each house were sealed for hygiene and ease of transport.

In the centre of the plan is the group of administrative buildings (c, d, and e). On the left of the road is the incubator building (c), which included office accommodation for the manager and clerk. Opposite is the two-storey food store (d) and next to it the killing and plucking room (e). The advantages of having these administrative buildings together and under the close control of the office are self evident, and the placing of these buildings on a metal road facilitated the intake of food, dispatch of processed chickens, and distribution of material around the plant.

Near the public road is the garage (f), which was subsequently converted into a workshop for the making of small equipment for the brooder and growing houses. Alongside the workshop was a small cowbail, later converted into a store. At the back of these buildings was constructed a small concrete yard to which all small equipment such as troughs, drinking fountains, and wire floors was taken at regular intervals for cleaning and disinfection. This addition to the plant proved invaluable.

Of the remaining buildings marked on the sketch plan, (g) is the manager's house, (h and i) small cottages, and (j) a dirty-litter shed. The plant was fully equipped for the work undertaken.

While it was used solely for producing table birds, the paddocks surrounding the buildings were not used for poultry production beyond the growing of green food. It was envisaged that this additional land would be essential if the property were later developed for general poultry production.



Plan of Poultry Demonstration Plant—a. Brooder houses. b. Rearing houses c. Incubator room and office. d. Food store. e. Killing and plucking room. f. Garage, workshop, and store. g. Manager's residence. h, i. Cottages j. Cart and manure shed.

Methods of Management

The production of table poultry in quantity weekly throughout the year presents a number of problems, one of which is ensuring a continuous supply of day-old chicks. No attempt was made to establish a breeding flock at the Table Poultry Plant, but hatching eggs or day-old chicks were taken from the Poultry Station, Wallaceville, during the whole of the period that chickens were supplied to the U.S.J.P.B. Unfortunately the Wallaceville flock was not large enough to supply all the chicks required, so contracts were made with poultry farmers within easy distance of the farm for hatching eggs on a weekly basis, except during the normal breeding season, when sexed day-old cockerels were taken instead of eggs. As the product required by the U.S.J.P.B. was an undrawn bird of only 2½lb. average weight, it was possible to take White Leghorns or Leghorn crosses for this purpose. This simplified the supply position considerably.

Starting in the early stages with only 100 to 200 chicks weekly, the intake rose to more than 1,000 chicks a week or the equivalent in hatching eggs. A number of poultry farmers were most helpful in assisting to maintain the intake during the difficult winter period and before the beginning of the normal breeding season.

Incubation was carried out in a "10,000-egg capacity" cabinet machine placed in a room designed for the purpose. Hatching results, and the class of chick, varied with the time of year and the source of the eggs. Over the whole period of production, however, hatching results were satisfactory, and the incubator room proved efficient in all respects.

Passing from the incubator room weekly, batches of chicks were transferred to the brooder houses marked (a) in the sketch plan. Up to six pens a week were filled, the maximum brood under one hover being 200 day-old chicks. Each pen had an electric hover hung over a wire-netting frame. Considerable trouble was taken with practical tests to find the most efficient method of using these wire frames, and it is intended to publish an account of the method which subsequently proved most efficient and which is still used on the plant. The illustrations include the general lay-

out of one of these brooder pens, where the chickens were maintained until between six and seven weeks of age.

Chick feed or chick grain and a normal chick mash were fed to the birds during the six-weeks' brooding period. The mash was fed dry and supplemented with ample greenfeed. Each brooder pen had a floor space 12ft. by 16ft., an open front with protection shields for use in bad weather or at night, and baffled eave ventilation at the back of the pen. The floors were concrete and covered with sand and chopped straw. Care was taken to harden off the chicks from heat completely by six weeks, at which age they were transferred to the growing pens in houses marked (b) on the plan.

Severe Culling

The 200 chickens from one brooder house, less mortality and culls, were divided equally into two growing pens, each 14ft. by 16ft. and fitted with perching suitable to young chickens. A feature of this transfer was the severe culling. No chick not considered to have a first-class chance of making a prime chicken at killing age was placed in the growing pens. Furthermore, since one brooder pen became two growing pens at that stage, the chickens were carefully graded for size, affording the maximum advantage to the smaller birds, which were grouped together and away from competition by birds larger than themselves.

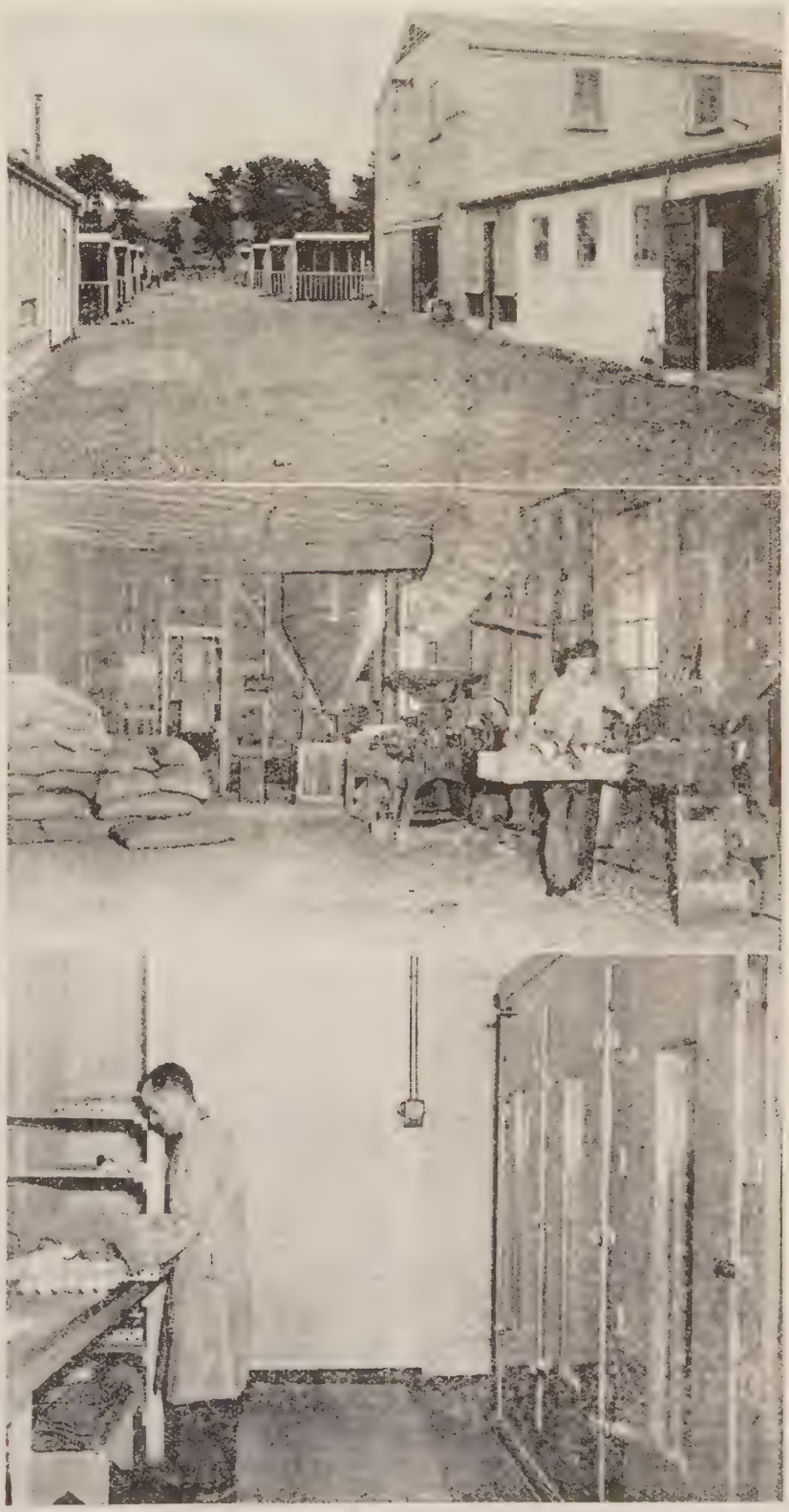
This severe culling was a drastic policy, and the grading of each pen absorbed time and labour. Nevertheless, it was sound and prevented waste of food, space, and labour among the growing stock. Of even greater importance, it assisted materially in sending batches of chickens reasonably even in size and condition to the plucking room.

The Table Poultry Plant was often referred to by the public as the "Government Fattening Plant." But no chickens were subjected to any form of fattening. Killed at 13 or 14 weeks and being only 2 to 3lb. dead weight, these birds did not reach a stage where fattening would have been practical or economic. The majority of the birds were White Leghorns or Leghorn crosses—not a type suitable for fattening.

Difficulties Experienced

Difficulties were expected when the project was first mooted. Any large plant of this type built in peacetime would experience some "growing pains," which were much more probable during the war, with shortages of materials and skilled poultry labour, and above all lack of time to allow consolidation as each stage of pro-

POULTRY PLANT BUILDINGS



Upper—Administrative buildings and incubator house on left; killing and plucking rooms and food store on right. Middle—Interior of food store showing greenfeed cutter, grister, and dry mash mixer. Lower—Interior of incubator room.

BROODER HOUSE AND LAYING HOUSE

Upper—Brooder house pen. Lower—Growing house now used as a laying house. Note use of intervening ground for greenfeed crop.

KILLING AND PACKING ROOMS

Left—Killing room. Right—Interior of table poultry packing room. Note racks for holding birds before packing.

duction was reached. The usual problems associated with "green" concrete floors and damp litter appeared. Coccidiosis, and for a short time even blackhead, caused losses and anxiety to those running the plant, but such troubles could and would have been brought under control within a reasonable time.

It became apparent that other factors were adversely affecting the rearing, resulting in heavy and continuous losses. The problem was placed in the hands of the officers of the Animal Research Station, Wallaceville, veterinary and poultry authorities from among the officers of the U.S.J.P.B. were consulted, and practical poultry farmers were invited to the plant and asked to express their opinions, which were many and divergent. Many suggestions were carefully tested and some improvement resulted, almost entirely the result of improved management. Nevertheless, losses were still abnormally high.

Finally, it became obvious that the problem was one of environment. The factors of stock, feeding, management, and disease were eliminated in turn. The problem resolved itself into a combination of two factors: Insufficient flow of air through the brooder houses and an accumulation of moisture under the floors—so simple when committed to paper now, but how baffling at the time!

After the removal of the baffle board from the back ventilation opening, and the digging of a trench the full length of the back of the brooder house, rearing became normal within a comparatively short period. Houses built in parallel lines and only 25ft. apart sheltered or baffled one another. A baffle board on the house itself slowed down the air currents too much, and ventilation was poor in spite of an open front. The moisture problem was associated with the wartime makeshift method of carrying away storm water from the roofs and the fact that the land had been severely "panned" with clay when levelled with heavy graders before the houses were erected.

The trouble received considerable publicity at the time. It is always easy to be wise after the event, but many of the ordinary signs of poor ventilation and dampness were not evident. Had the problem not been solved completely no attempt would have been made to develop the plant for post-war purposes. If the problem had been one of disease it would have crippled the plant—probably for all time.

High Standard of Hygiene

The U.S.J.P.B. required that the birds should be killed and processed according to American standards, and the hygiene of the slaughter room, plucking room, and packing room had to satisfy their inspection officers. American standards are high, particularly compared with the average conditions under which poultry are slaughtered in New Zealand at present.

The interior walls throughout the killing, plucking, cooling, and packing rooms are painted with a washable white paint. The floors are concrete, properly drained to permit frequent washing. All equipment within the building is enamelled white where possible and can be efficiently cleaned. In fact, everything was done to make the building hygienic and suitable for handling food intended for human consumption.

The cooling, grading, and packing room is separated from the killing and plucking room by fly-proof gauze. It is fitted with an exhaust fan in the ceiling and an intake fan on the southern wall; in this way the room is cooled in summer and the chickens were dried before packing. The packing room has racks on which the clean plucked chickens were hung to dry and lose body heat. A bench for grading, packing, weighing, and sealing the boxes completes the more important features of this room.

At no time were any complaints received from inspection officers about the equipment or building used for handling their chickens, and the board reported favourably on the quality throughout the production period. Only one complaint was received: The quantity was insufficient. Even when the plant was producing 800 to 1,000 a week the cry was still for more.

Killing and Processing

Taken from the growing houses in crates with wire-netting bottoms, the chickens were placed in a shed with immediate access to the killing room. The method of killing stipulated by the board was sticking and bleeding. The bird is hung by its legs on a rack. A sharp, narrow, two-edged, pointed knife is then thrust up through the roof of the bird's mouth and the main artery at the back of the head severed. The blood flows freely and the body is completely drained through the mouth.

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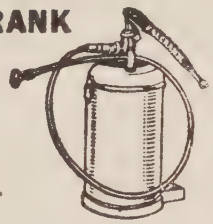

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As soon as the bird had been bled it was removed from the rack and plunged into a tank of water maintained at a temperature of 134 degrees F. by an electric element, thermostatically controlled. The bird was kept in the water for about a minute and, held by the legs, moved up and down with a turning motion to ensure that the hot water penetrated under the feathers. This semi-scald method loosens the feathers but does not injure or scald the flesh, which would be particularly harmful when the bird is subsequently placed in the "freezer."

From the hot-water tank the bird was transferred to a rack, where it was suspended by its legs. Wet plucking followed immediately, care being taken not to damage the surface of the skin by excessive "rubbing" movement. Damage by rubbing quickly discolours when the bird cools and will "burn" if placed in the freezer. Stubbing, or the removal of small pin feathers, followed the plucking, and the bird was ready for cooling. Men did the sticking and plucking, and a team of women handled the stubbing. These women also "tied" the legs against the body with rubber bands, a method of processing birds commonly used on the London market.

Once stubbed and "tied" or "shaped" the birds passed through into the packing room for drying and cooling. During hot summer weather they were plunged into a tank of cold running water to remove body heat.

In table bird production there are two essentials which vitally affect keeping quality: The birds must be starved for about 24 hours before being killed, and completely cooled after plucking before packing.

Grading and Packing

When they were cold the birds were graded for size and quality and finally packed in wooden cases, 12 to a case. Two sizes of case were used for birds going to the Americans. This permitted the standard number of 12 to each pack while allowing grading for size to give uniformity to the pack. Uniformity of size, quality, and appearance are essentials of an attractive and easily-handled table poultry pack.

Wooden cases, parchment lined, were chosen for wartime production because they had to withstand rough handling after leaving New Zealand, and for the same reason each case when nailed up was tied with no fewer than two bands of steel wire.

More Than 30,000 Produced

In spite of the difficulties associated with running a rapidly-erected plant, a shortage of skilled poultry labour, and ultimately a shortage of food which forced a severe curtailment of the intake of birds, more than 30,000 first-class chickens were despatched to the U.S.J.P.B. A quantity greater by at least half would have been sent if food supplies had been available. The food shortage coincided with the solving of major rearing problems. It came as a disappointment that lost ground could not be made up from that point onward. In fact the intake of day-old chicks to the brooder houses had to be reduced to fewer than 500 a week—less than half the production capacity of the plant.

Many risks were taken to develop rapidly a plant of considerable size. Had proper guttering been available for carrying away water from the extensive roof area (well over 33,000 square feet) many more chicks would have been reared from the start. Nevertheless, the plant achieved much and helped to fill a need expressed by the American authorities.

What of the Future?

Much energy and capital were spent on a wartime project. The obvious course was to explore the potentialities of this plant for post-war purposes. Two major points had to be considered: 1. How could the existing buildings best be employed without undue additional capital cost? 2. What developments of the plant would be of use to the poultry industry in the future?

Though no final statement of developments can be made at present, some indications of the future of the plant are permissible. Food supply difficulties facing the industry today must slow down many of the developments under consideration. The following is therefore a brief account of reorganisation and developments either decided on or under consideration:—

1. The plant has been taken over permanently under the direction of the Department of Agriculture. The name "Table Poultry Plant" had disappeared with the cessation of table poultry production on a large scale. The name "Poultry Demonstration Plant" has been substituted and the place name Upper Hutt stressed to prevent confusion with the older Poultry Station at Wallaceville.
2. The Poultry Station, Wallaceville, more than 20 years old, has been closed down and is being dismantled. The flock and all building material of value are being transferred to the new plant. Enquiries for stock or information should now be sent to the new plant.
3. Four major developments are being considered for the new plant:

(a) **A table poultry production unit** including breeding stock suitable for this purpose to handle an output of about 12 dozen birds a week. This unit is almost completed but will stand idle until food supplies again permit the production of table birds.

(b) **A pedigree breeding unit** for the production of pedigree stock for sale and to include progeny testing. This unit is being proceeded with at present and will be completed before the end of next summer.

(c) **A laying flock** to be maintained under both intensive and semi-intensive conditions for experiment and demonstration. This unit will be completed within the next 12 months, but will not be fully stocked until food is again in reasonable supply.

(d) **A laying trial** with a possible capacity of up to 300 birds. No attempt will be made to proceed with this unit until the food supply position permits and until its value and policy have been discussed in detail with the industry through the New Zealand Poultry Board.

Little New Construction

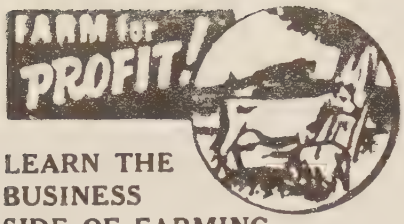
Of these four units, only the pedigree unit requires completely new housing. The remainder will occupy existing housing after internal reconstructions. Range houses for growing stock on free range are already available from Wallaceville. Fortunately administrative buildings, such as food store, incubator house, egg room, and office accommodation, are already adequate to the new organisation.

Thus at a comparatively low cost the old wartime project can be changed over to a modern educational plant which it is hoped will be of considerable interest and value to all classes of poultry producers.

All photographs by Photo News, Ltd.

PULLORUM DISEASE.

Pullorum disease, often called "B.W.D.," is a disease of baby chicks, which occurs in a mild form in the Dominion. Every year in England and U.S.A. this disease creates havoc among poultry flocks. It is in the economic interests of the New Zealand poultry industry that this disease should not become more firmly established. Bulletin No. 191, "Pullorum Disease," contains information on the precautions to be taken against this disease. This bulletin is available free from offices of the Department of Agriculture.



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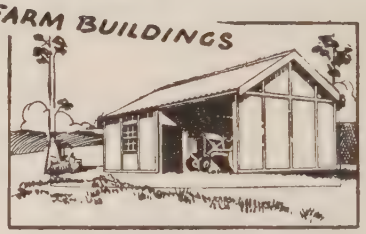

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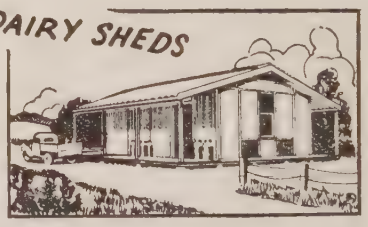

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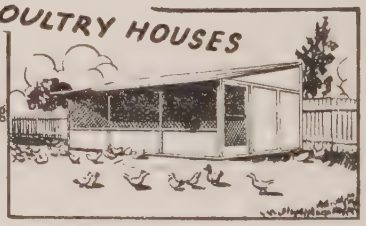

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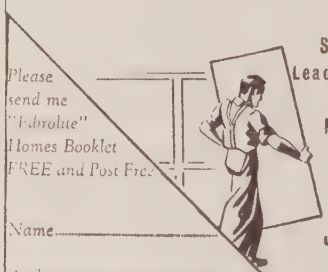

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AVOCADO CULTURE IN NEW ZEALAND

By J. D. KENNEDY, *Orchard Instructor, Gisborne.*

THE tropical or sub-tropical plant avocado belongs to the genus *Persea,* one of the laurel family, which includes such economic plants as the camphor and the cinnamon. The common native Californian bay tree is also a member of the family. The cultivated species of the genus are natives of Mexico and Central and South America, but can be successfully grown in temperate climates.

The avocado pear.

COMMERCIAL culture of the avocado pear is limited to localities with relatively mild winters such as occur only in tropical and sub-tropical regions. In general, avocado and citrus trees exhibit somewhat the same range of climatic adaptation, but it is already clear that, on the basis of varieties grown at present, the commercial culture of the avocado is destined to be as fully restricted as that of the lemon, if not more so.

Some twenty years ago four trees were raised from seed by an orchardist in the Gisborne district, and they grew and developed exceptionally well. Two began cropping at eight years, but the other two, though flowering prolifically, have not yet borne fruit. Consignments of fruit have been forwarded to the auction marts, prices and quality being comparable with those for the imported fruit.

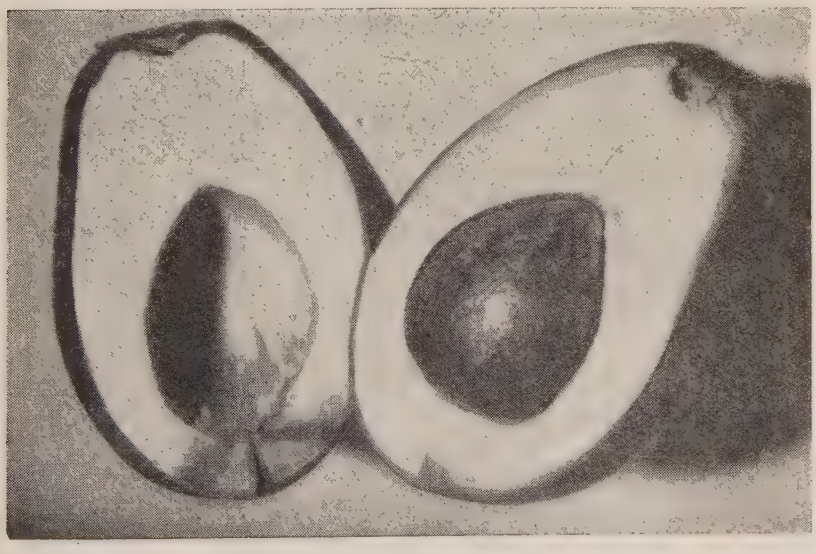
The grower foresaw a profitable new industry, and four years ago he imported from California ten named proved varieties—Anaheim, Edranol, Mexicola, Duke, Ryan, Furete, Benik, Nabal, Peubla, and Leucadia. His object was to select the varieties most suitable for New Zealand conditions. All trees are developing well, more particularly Duke, Nabal, and Mexicola.

Promising Varieties

Duke.—This is one of the most promising varieties raised in recent years. The fruit is dark green, oval, and has a small seed. The flesh has a smooth, buttery appearance, with little of the discoloration often found in other kinds when fully ripe. There is no fibre in the flesh and it is recognised as one of the best flavoured avocados. Apart from its fruiting value it is highly ornamental. It tends to be bushy, and grows equally well on heavy and light soils.

Nabal: One of the leading varieties, Nabal is recognised as a heavy cropper. The fruit is large and round, with a smooth skin, small seed, and exceptionally good flavour and quality. Because of its hardy nature, it could be recommended for early planting. It is of the bushy type and grows equally well in heavy and light soils.

Mexicola: One of the hardiest avocados is Mexicola, which can be counted on to bear consistently and at an early stage. The fruit is small, dark purple, and of excellent quality, suitable for home use. A large, vigorous, hardy tree, it will stand excessively warm conditions, but is not affected to any degree by cold winds and is fairly resistant to frost. It thrives well on dry or fairly heavy soils.



The avocado pear sliced.

Wide Range of Soils

Observations on the behaviour of the avocado indicate that it thrives on a wide range of soils. Commercial plantings could be successful on light sandy soils or heavy rich loam, and on many types between these two. However, it seems to do best on a medium-textured soil. For satisfactory results a depth of at least three feet is required. The avocado is extremely sensitive to poor drainage and will not endure saturated soil.

In selecting a site for an avocado orchard, the character of the subsoil should be carefully determined. Clay layers, limestone, or hardpan close to the surface are specially unfavourable because of the intolerance of the avocado to poor drainage.

AVOCADO PEAR CULTURE

Nutritive Value

The composition of the avocado is remarkably different from that of other fruits used fresh, the closest resemblance being found in a ripe processed olive. Its average protein content, 2.1 per cent., is about three times that of most fresh fruits on the market—apples, pears, grapes, berries, citrus, or bananas—though the olive has a slightly higher proportion than the avocado. In minerals, represented by ash, the average content of 1.32 per cent. is between two and three times that of common fresh fruits. The average dry-matter content, 29.44 per cent., is higher than that reported for any other fruit, the closest competitor being the banana with about 25 per cent.

In fat or oil content the avocado differs greatly from other fruits with the sole exception of ripe olives. Whereas most fruits contain little or no fat, the average for the avocado is 20.6 per cent.

It is evident, therefore, that for protein, minerals, and fat the avocado stands at the head of the list, and it contains fully half the carbohydrates found in many fresh fruits. These facts alone warrant the conclusion that this fruit contains nutritive values far exceeding those of other fresh fruits.

Uses of Avocado

The avocado is principally used as a salad food. As its food value becomes more appreciated, it will undoubtedly find a much larger place in the diet. In addition to its common use for salads—because of its nutlike flavour and creamy consistency—it has been found to blend with other dishes such as salad and mayonnaise dressings or sandwich spread, and the writer can vouch for it as a savoury with cold meats and vinegar dressing.

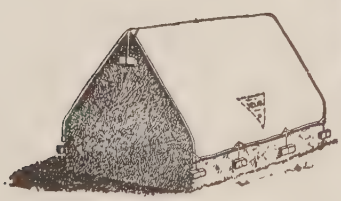
The reception which these innovations have met is an indication of the popularity the avocado will enjoy when it is placed on the market in sufficient quantities and at a reasonable price.

SPACING FENCING POSTS.

This table is a handy ready reckoner of the posts required at specified spacings for a length of fencing:—

Distance apart.	No. of posts Per chain.	Per mile.
6 ft.	11	880
8 ft.	8.25	660
8 ft. 3 in.	8	640
9 ft.	7.33	587
10 ft.	6.6	528
12 ft.	5.5	440
14 ft.	4.71	377
15 ft.	4.4	352
16 ft.	4.125	330
16 ft. 6in.	4.0	320
18 ft.	3.67	293
20 ft.	3.3	264
22 ft.	3.0	240

Staples—
Post: 1¾ in. x 7 or 1½ in. x 8, 42 staples weigh 1 lb.
Batten: 1 in. x 12, 200 staples weigh 1 lb.



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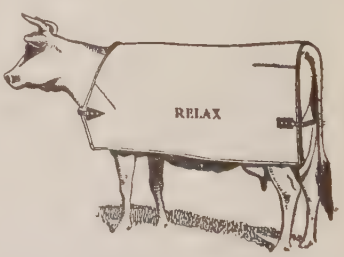

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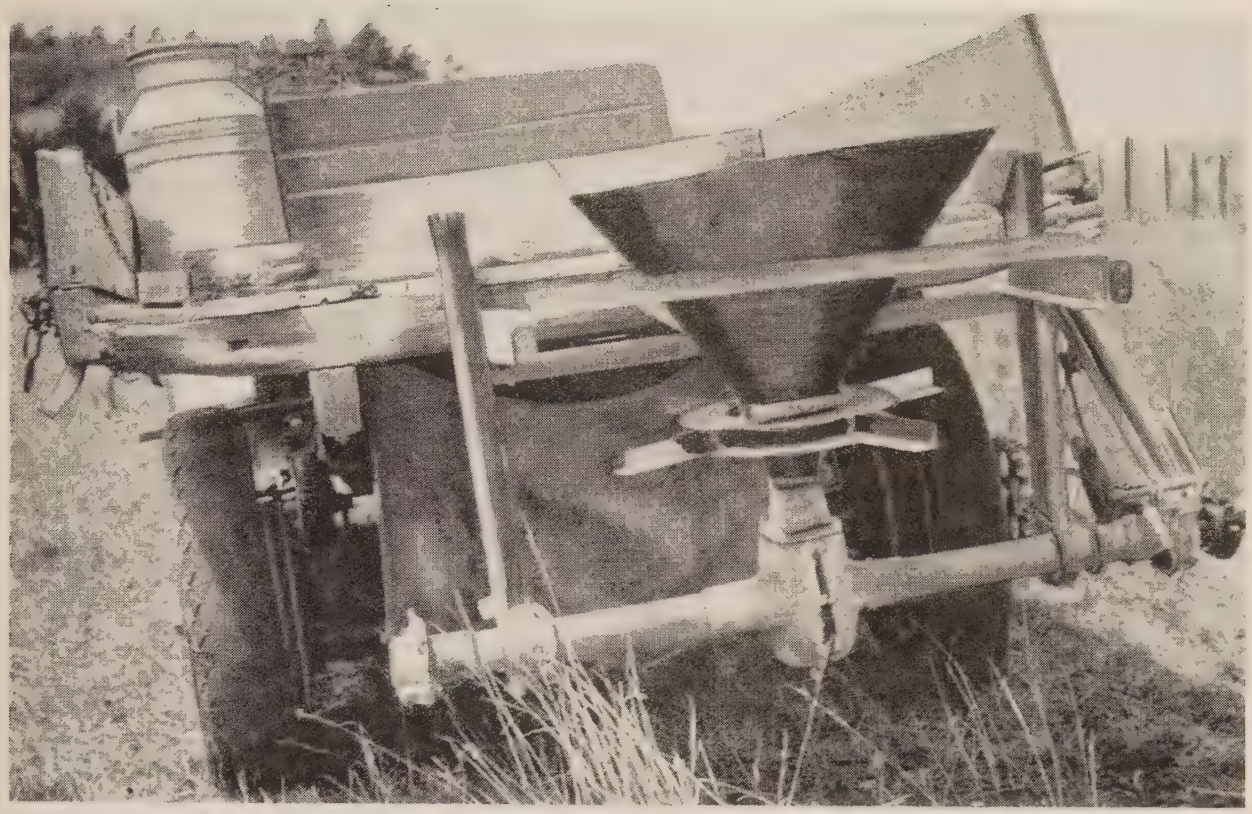

Above—Rear view of topdresser fitted on truck. Note leather guard under spinner to prevent dust entering the differential.

INGENIOUS HOME-MADE TOPDRESSER

By P. S. SYME, *Instructor in Agriculture, Warkworth.*

AN efficient rotary topdresser which can sow lime or fertiliser at from 1cwt. up to 2 tons per acre, which will operate wherever a truck can travel, and is capable of covering up to 50 acres per day can be made at an outlay of less than £8. The farmer who has been searching for such a machine at such a price is not likely to find it, however, but if he has a mechanical bent and a convenient junk yard, it is not so very difficult to build it for himself. Such at any rate is the experience of Mr. L. Hutchison, an Albertland farmer.

AS will be seen from the illustrations, the basic parts of the machine have been obtained from an old motor car. The frame of the chassis provided material for the carrying brackets, while the rear axle was used to operate the spinner. The brackets were simply cut to length, bent at right angles, and welded in position. The horizontal arms of the brackets are easily bolted to the floor of the truck and carry the whole weight of the machine.

The spinner or turntable was made from the discarded tops of two 40-gallon oil drums which had been cut open for skim-milk containers, and is 14in. in diameter. The lower of these has a hole cut to fit the universal of the drive shaft, while the upper has a 9in. diameter hole to allow the fertiliser to drop on to the bottom disc. The discs are separated by four radial pieces of 1½in. angle iron (from an old bedstead) each 12in. long and placed so that the angle faces the direction of motion.

To maintain a regular feed of fertiliser from the hopper, a ½in. bolt is screwed into a threaded hole drilled into the pinion shaft and held firmly in position by a lock nut. This bolt projects vertically through the bottom of the hopper and is fitted with two radial agitators made from the ends of the old car brake rods, which are clamped on to the bolt so that they turn with it in a horizontal circular motion. The lower agitator is 2in.

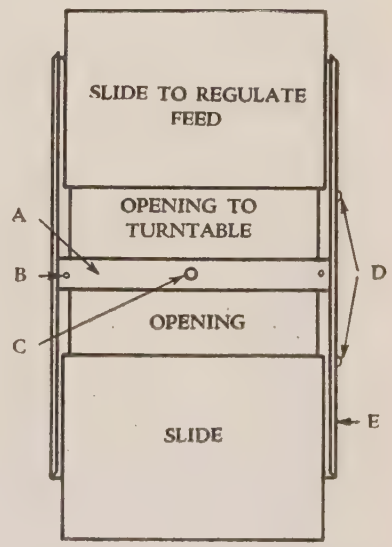

Diagram showing how regulating slides are fitted to bottom of hopper.

A. Strap iron 1¼in. x 3-16in. B. Rivet. C. ⅜in. hole for agitator. D. Screws fixing angle iron to hopper. E. Angle iron 1in. x 1in. x 1ft.

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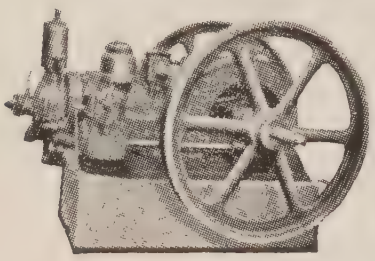

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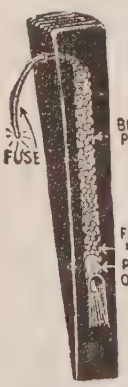

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long and is fixed about 1in. above the bottom of the hopper, while the upper is 3in. long and is fixed about 3in. above the lower one. Although very simply improvised, this mechanism provides a very satisfactory feed.

The hopper was cheaply constructed from the dashboard of an old truck. It is provided with two sliding plates under the bottom, which regulate the rate of sowing.

The spreader mechanism is operated through a small 15-tooth pinion connected by a chain drive to a 20-tooth driving pinion on the rear wheel of the truck. With the back-end ratio of 5 to 1, this gives a turntable speed of about 300 revolutions per minute at 5 m.p.h., which is fast enough travelling on the difficult terrain of much of the land in the district. To prevent the spider gears in the differential from turning some of the spaces between the teeth were filled up with brazing, and the left-hand driving axle was removed to reduce friction.

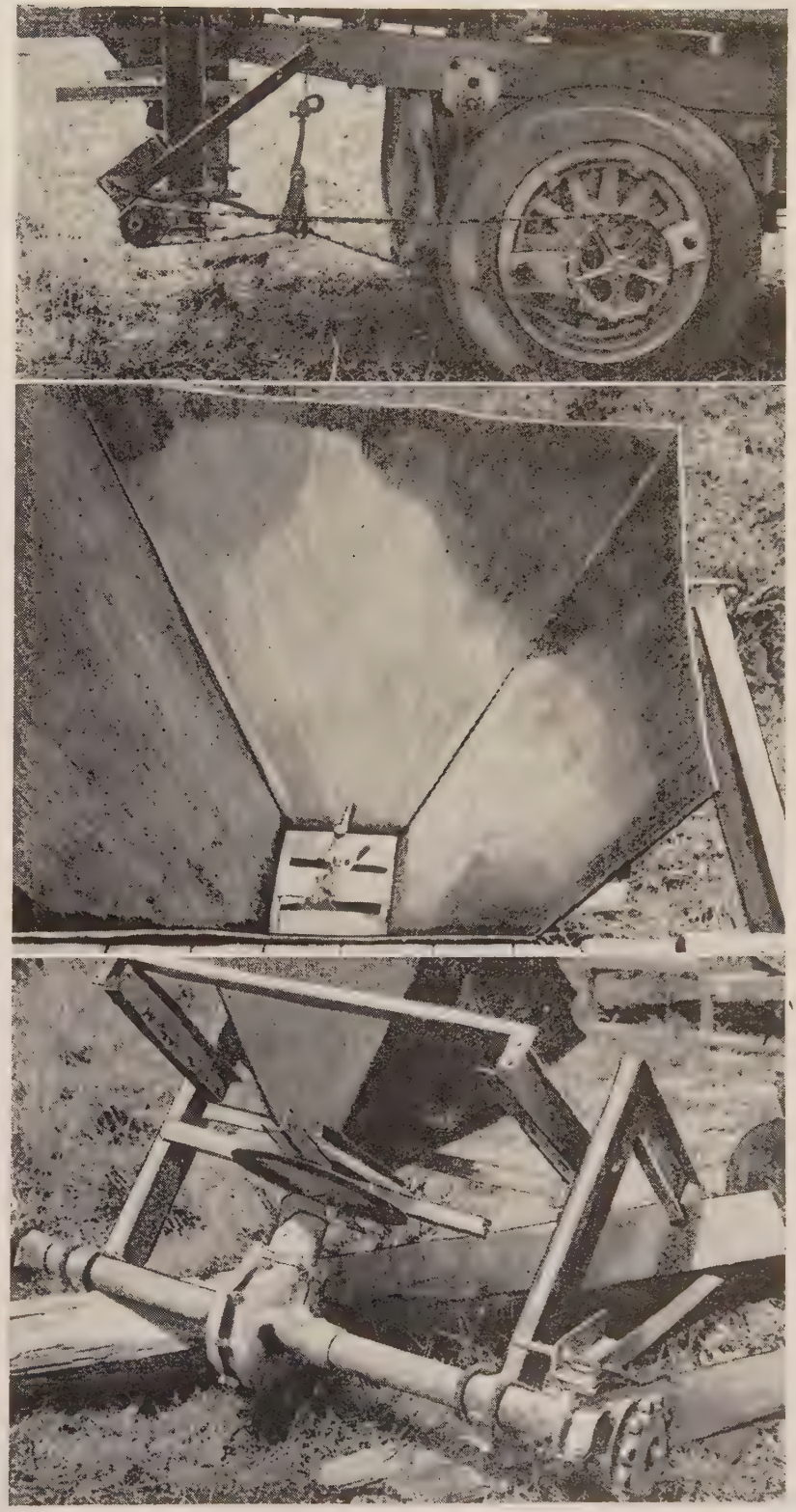
As already mentioned, the component parts of the machine were mainly picked up as scrap, while the construction work was mostly performed by Mr. Hutchison himself. The following is an itemised list of the out-of-pocket costs:—

	£	s.	d.
Old car chassis	2	10	0
Cutting and welding carrier members		7	6
Brazing of spider gears		2	6
Cutting and making hopper (torch)	1	0	0
Turning out small driving sprocket and brazing to hub		12	6
Two driving sprockets and 10ft. of chain for main drive	3	2	6
Driving wheel clamp for large sprocket home made from scrap		—	
	£7	15	0

A very brief demonstration suffices to show that the efficiency of this home-made distributor can in no way be measured by its cost. It can sow evenly over a wide range of rates per acre, and the rate can be adjusted merely by opening or closing the two regulating slides. It is speedy in action, and gives a 30ft. coverage using ordinary superphosphate. Moreover, it can be fitted to the truck or detached in a matter of minutes—a point of some importance when the truck is regularly employed on a wide variety of odd jobs. Experience has also shown that it is reliable. Used on a 30cwt. truck it sowed over 100 tons of lime and fertiliser last season, and on one occasion covered 30 acres in five hours at 10cwt. per acre on country that was both difficult and uneven.

There is certainly no lack of old cars to supply material and there are plenty of clever amateur mechanics capable of improvising a distributor on the lines described. Considering its efficiency and low cost, such a machine has obviously a useful place on many farms.

CONSTRUCTIONAL DETAILS



Upper—Side view of main drive from rear wheel. Note the reinforcing brace and the flexible substitute for a jockey pulley. Middle—Inside view of hopper showing agitator mechanism and regulating slides. Note how the ends of the brake rods are clamped to the vertical spindle. Lower—Close-up of general construction.

FODDER CROPS

[*Green and Hahn photo.*

Fattening lambs on rape.

More fodder crops should be sown this year to bring about greater production of food for export.

The productivity of many farms could be improved by breaking up the poorer grassland, sowing in fodder crops, and then resowing to grass, using the improved strains of grasses and clovers which are now available.

For the production of more lamb an increase in the amounts of rape, chou moellier, or other suitable crops is necessary. Each year a large tonnage of lamb is lost to export because of the inability of farmers to top off those lambs that are not sold fat off their mothers.

For the production of more pig meat it is necessary to make increased provision for the wintering of pigs. Grow a quarter of an acre of roots for every sow, and for every 20 to 25 pigs to be wintered allow an extra acre of grain crop to alleviate the shortage of grains for pig feeding.

FARM WORK FOR SEPTEMBER

By the Fields Division

PASTURES

Harrowing Pastures.—During the winter the ground will be much fouled from the feeding of hay and other fodders to stock. Where this has occurred pastures will require harrowing to spread the animal droppings. An efficient, penetrating harrow which does not block easily is required to deal with the masses of material—remnants of hay, silage stalks, and large amounts of dung—which lie on the ground. If the ground is very badly poached, it should then be rolled to flatten the surface and reknit the turf. This is better done when the ground is sodden with moisture.

Topdressing.—Although still rationed, some fertiliser should be spared for topdressing pastures sown last autumn. Treatment at this stage of a pasture's life can make or mar its future, and young pastures require heavy feeding.

Early Spring Sowing.—Areas of ground that have been in root or other fodder crops may be sown in pasture. Areas that are in cereals sown in the autumn can be oversown with pasture seeds, and where cereals are drilled this month pasture seeds can be sown at the same time. September is probably the best time for spring sowing to pasture.

Preparation of Land for Autumn-sown Pastures.—Land that has been ploughed or deeply cultivated for pasture should now, or in the near future, be in a fit condition for a second ploughing to prepare for spring and summer surface cultivation, so that an early sowing can be made next autumn. Land that has not been ploughed for autumn sowing should be ploughed as soon as possible. This will apply to areas in fodder crops which have been fed off during the winter. To permit better establishment of the pasture it is more advisable to work the land during spring and summer than to sow a catch crop.

With heavy soils, as soon as the land is in fit condition after the spring ploughing a start should be made to break up the soil with heavy harrows followed by discs and cultivators and further harrowings so that the soil is broken up before it is too dry. With light soils the area should be rolled on the furrow to compress the furrow slices before cultivating implements are used.

General.—Except in the colder parts of New Zealand pastures are now beginning to supply the bulk of feed requirements. They should be given spells between grazings to ensure that they produce adequate supplies of fodder.

HAY AND SILAGE

When pastures supply the full grass requirements for stock, fields may be shut up in rotation for production of hay and silage—the early ones for silage and the later ones for hay. Before shutting up harrow, and, if fertiliser is available, topdress them. During harrowing pick up any rubbish that may foul the mower when it cuts the crop. Inspect all silage pits to see that they are fit to receive the cut green material. Inspect tracks to and from the pit and repair them if they are not in good order. Particular attention should be paid to the condition of ropes on the hoisting gear and to the mowing machine.

LUCERNE

Old Stands.—Lime and topdress old stands of lucerne. It is better to do this now after the first cut than in the autumn when topdressing may encourage weeds.

New Stands.—Ground for new stands of lucerne, which should have been deep ploughed by now, should receive frequent harrowings to cultivate the ground and destroy weed seedlings. These harrowings should take place during spells of dry weather just after the weed seedlings have made their appearance.

CEREAL GREENFEEDS

Land for millet or maize to be used as greenfeeds, if not ploughed already, should be ploughed this month; if ploughed, the area should be cultivated with discs and harrows. In early districts with light soils maize for greenfeed may be sown towards the end of September with a fair chance of success. Ground which grew greenfeed for the winter, and on which feeding-off is completed, should be ploughed for the next crop.

ROOT CROPS AND CRUCIFEROUS CROPS

Fields ploughed for spring-sown root crops should be cultivated with discs and harrows when the ground is dry enough. If the land is difficult to work down it should be given another ploughing. In mild, moist climates mangold seed can be sown in beds to provide plants for transplanting later in the spring.

POTATOES

Ploughed land for October planting of the main crop should be worked with the cultivators and harrows. Complete the picking over of potatoes in pits and at the same time select seed for planting. Arrangements should be made to buy seed that will be required. In favoured localities potatoes may be planted this month.

CEREALS AND PEAS FOR GRAIN AND CHAFF

Cereal crops sown last autumn may be fed off this month. Those areas where it is intended to sow grass and clover seed should be harrowed after feeding off, the seed sown, and another harrowing given, followed by rolling. Finish drilling spring-sown wheat and oats early in the month and sow barley; an undersowing of clover and grass seed may be made at the time of sowing. Land for October sowing of maize, peas, and barley should be worked down this month. This is usually best done by heavy harrowing in the direction of the ploughing, followed by the cultivator and then the harrows.

STOCK

Calves should be gradually weaned off whole milk on to skim-milk and given concentrates to replace the fat in the milk. See that the utensils for feeding the calves are kept scrupulously clean and watch the young animals for any tendency to scour. Quarters should be warm, dry, and comfortable, ventilated and yet free from draughts.

Ewes not in lamb should be culled from the breeding ewe flock if this was not done before lambing commenced. Except for two-tooths these ewes should be fattened for disposal at the works. The tailing of lambs will now be in progress, and in the earlier districts should be completed. Sheds should be made ready for the shearing of sheep—in many districts the shearing of dry sheep will begin this month.

Pigs can be fed almost entirely on skim-milk now that it is becoming more freely available.

With pastures growing more freely a watch should be kept for bloat in dairy stock and for feed flavour.

GENERAL

Inspect shearing shed equipment and see that sufficient quantities of bales, twine, shears, cutters, and combs are available.

In cold districts tree planting and the planting of pampas grass are probably best carried out this month.

THE FARM TRACTOR

Every farmer should know enough of the working principles of his tractor to be able to undertake its maintenance. Bulletin No. 255, "The Farm Tractor," describes in detail the mechanism of the tractor and how simple repairs may be carried out. Write to the Department of Agriculture, Auckland, Wellington, Christchurch, or Dunedin, for this free bulletin.

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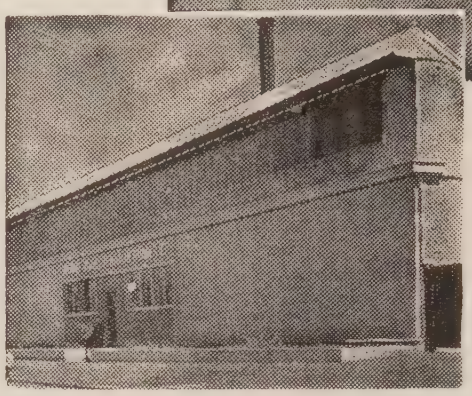
Every Seat is Needed



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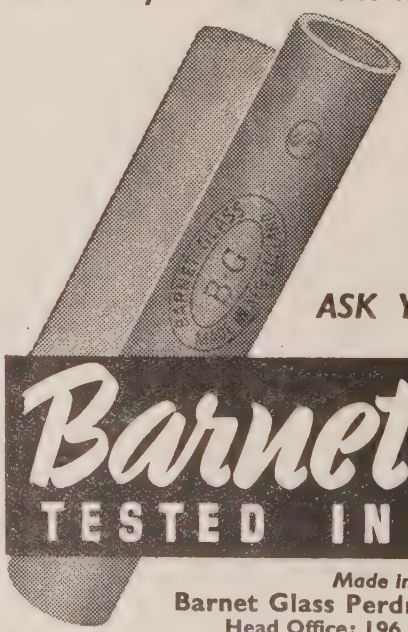

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STABILISATION AND THE FARMER

Mr. Walsh Addresses Dairy Conference

THE place of farming in the Government's policy of economic stabilisation was the main subject in the address of Mr. F. P. Walsh, who represents the Federation of Labour on the Economic Stabilisation Commission, to the National Dairy Conference recently. As Mr. Walsh's speech created a great deal of comment both at the meeting and in the Press, the text is reprinted below.

"WE have reached a stage when it is useful to look back over the work of the past four or five years and assess the results that have been achieved," said Mr. Walsh. "In fact, we must look at our past experience as well as the immediate facts of the economic situation if we are to plan successfully for the full development of our country.

"I invite you to look back 25 or more years to the period 1919-21. You will recall that it was in this period—the post-war phase of World War I—that New Zealand in common with the rest of the world experienced a disastrous boom and slump. Inflation in those years reached a higher peak than it had during the war years 1914-18.

INTRODUCTION OF STABILISATION POLICY

"When a second world war commenced in September, 1939, the Government took special steps to ensure that the cost of living for the community as a whole, and costs of production for producers and manufacturers, were kept within reasonable bounds. It was no accident that the Price Stabilisation Regulations were among the first regulations made after the Proclamation of Emergency. These first steps at price control were expanded in 1941 with the issue of a list of 38 stabilised commodities, and again in 1942 when the list of stabilised commodities was increased to include in all about 112 items of essential foods and services.

[*Spencer Digby, photo.*

Mr. F. P. Walsh.

"As early as 1940 the Government called together a conference representative of all economic interests in the community. The recommendations brought down by this conference and the later investigation by a working committee appointed from the conference formed the basis for the full stabilisation policy which was introduced in December, 1942. At this date, also, a Stabilisation Commission was appointed, and since then has functioned as an advisory body to the Government on matters relating to the economic stability of the country. The stabilisation policy adopted was based on a bargain between the major economic groups in the country, arising from the original stabilisation conference. This bargain was a fundamental feature of the national unity in economic matters which was achieved during the war, and I will speak later of its implications for the post-war period.

THE PLACE OF FARMING UNDER STABILISATION

"The special place of farmers in New Zealand's economy has always been recognised, and it is significant that one of the first important undertakings of the newly-appointed commission was the negotiation of an agreement on stabilisation between the Government and the Farmers' Federation. This agreement provided for the establishment of stabilisation accounts for the principal farm products into which are paid all increases in price above that ruling in December, 1942, from the sales of produce overseas. Subsidies paid to hold cost of production were to be debited to the accounts. The agreement provided that credit balances in the accounts at the termination of the stabilisation scheme would be used for the benefit of the industry concerned, while debit balances would be met by the Government. The final clause provided that while the agreement was in force prices received by the farmer would not be allowed to fall below the level ruling at December, 1942.

"This agreement has provided the framework for all the Commission's dealings with farming interests, but the dairy industry received special attention. Just after the farmers' agreement was completed a special Costs Adjustment Committee was established on which the dairy industry was fully represented. This committee devised a formula and produced recommendations to the Government which, when adopted, had the effect of offsetting any increase in costs which had been incurred since 1938. In subsequent years the Costs Committee has been reconvened and adjustments made in cost allowance payments to compensate for such increased costs as could not be held at the source by direct subsidy payments. The point I want to stress is this—that within the stabilisation policy it has always been possible for the industry and the Government to reach complete agreement in the yearly negotiations.

FARM SUBSIDIES

"I would like to correct a misleading statement which appeared in the National Dairy Association's recent annual

report, with reference to subsidies and stabilisation accounts. It was stated there that 'the cost of subsidies on fertilisers and other commodities, farm and factory cost allowances, subsidies on stock feeds, subsidies on grain crops for pig feed to save importation of grain, and many others are found out of these accounts; and not one penny comes from the Consolidated Fund, the War Expenses Account, or any other public source.'

"The true position is that for 1945-46 the amounts paid from the Dairy and Meat Stabilisation Accounts are estimated to fall short of total payments from the War Expenses Account, for subsidies on the items mentioned, by about £1 million. The statement is also incorrect in that during the war years prior to the stabilisation agreement the Consolidated Fund had already carried about £2¼ million in superphosphate subsidy alone, of which about £1¼ million could be considered as subsidy to the dairy industry. Further, I would point out that the liability of the Dairy Industry Stabilisation Account in respect of subsidies is definitely limited by the agreement of March, 1945, so that if wage costs rise above certain levels, the increases are not chargeable against the Dairy Industry Stabilisation Account. In addition, it should be mentioned that all farmers get the benefit of general stabilisation subsidies, as distinct from those which can be classed as purely farming subsidies. General stabilisation subsidies not only benefit farmers as consumers, in the same way as they benefit all other consumers, but they benefit farmers as producers because the holding of cost of living items keeps the general level of wages down, thus holding farm and factory costs. These points are commonly forgotten when statements are made to the effect that farmers pay all their own subsidies.

THE HOLDING OF COSTS

"This question of holding costs is fundamental to the stabilisation policy. The policy had two main aims and they were:—

"1. To hold the cost of living so that the war effort would not be impaired by any suggestion that the cost of the war was being thrown unfairly on one group to the benefit of another.

"2. To maintain our costs of production at as low a level as possible so that New Zealand might emerge into the post-war world in a favourable position compared with her competitors in the world market, thus ensuring a continuity of prosperity and stability in the difficult adjustment stage that we are now meeting.

"In other words, we had learnt the futility of boom and slump conditions, and were determined not to endure the social evils attendant on inflation if that could possibly be avoided. There are still many critics who advocate the short-term and short-sighted policy of price increases to the extent that the proceeds from an overseas market will allow. There are many answers to this form of criticism, but it will be sufficient to draw your attention to the fact that higher prices would inevitably have meant higher costs and that costs once incurred are very difficult to reduce. The nation with the low cost structure, particularly the primary-producing country, has the position of advantage when the world market is in a state of readjustment. There is a particular advantage in the case of the dairy industry where major competition may come from margarine as well as from other primary-producing countries.

"Stabilisation in New Zealand means a divorce of internal prices from overseas parity. If stabilisation is to be held in New Zealand, fortuitous increases or decreases in overseas prices must not be allowed to play havoc with internal prices and costs. There is a definite link between farm incomes and the general wage level. If one goes up, the other goes up, and there is a needless upward pressure on costs. The purpose of pool accounts is to avoid shocks of this nature being administered to the economy.

COSTS AND THE UNITED KINGDOM MARKET

"Nothing is more certain to lead to a contraction of markets for our foodstuffs than high costs and high prices. During the transition period of scarcity the United Kingdom is compelled to grow a high proportion of foodstuffs regardless of prices and costs, because none of the food-producing countries can export enough to meet the demand in England and other countries. But when the scarcity period is over, and the volume of production everywhere is greater, the United Kingdom can and will reorganise its agriculture, placing chief emphasis on liquid milk, eggs, and vegetables. At present there is an over-emphasis on cereal production. Since the outbreak of war this had led to the killing of nearly 7 million sheep, 2½ million pigs, and 20 million fowls. The pre-war livestock population was 27 million sheep, 4½ million pigs, and 69½ million fowls. The emphasis on cereal production will eventually be replaced by the development of pasture lands and market gardens. But this will happen only if England can be assured that she can import all other needed food products—butter, cheese, cereals, and meat—at reasonable prices. With imports too dear, England will be forced back to producing a larger part of her basic foodstuffs and so reduce the market open to us. The same effect would be achieved by a concentration on the production of margarine. This means, simply, that New Zealand can be its own worst market enemy if it does not fight for lower costs of production and higher efficiency.

"One man's costs are another man's income, but if lower unit costs are combined with greater productivity the question of adverse effects on anyone's income does not arise. The contrary, rather, is true, because more real wealth is produced. My advocacy of reducing unit costs arises from my belief that both farmers and farm workers are entitled to have their standard of living increased in a manner commensurate with that of the rest of the community. The background to everything I am saying is the assumption that, if we organise our economy wisely, we can, now that the war is over, progressively raise the living standards of our people. But living standards, in a time like the present, are not raised by inflating money incomes; they can be raised only by increasing our output of goods and services. So long as this output is increased, costs can be held without any damage to the standard of living.

COSTS IN RELATION TO STATE ASSISTANCE

"It must be remembered, too, that as world production increases and the scarcity phase passes, the danger of falling world prices will inevitably emerge. The country that has kept its costs low and its efficiency high will meet that danger half way. Should the New Zealand dairy industry fail in these respects, it will more and more become an assisted industry, kept on its feet only by contributions from State funds. There are evident signs that New Zealand farming, while resenting Government interference, is not reluctant to seek Government assistance when it suits. Within every farming group there is the marginal man, the comfortable man, the rich and the opulent man. But no farming group has yet devised a plan whereby the group as a whole will come to the rescue of the marginal man. The marginal man is, they tell us, the State's responsibility, and the State is expected to help the marginal man in such a way that it also helps all others in the group that need no help at all. The result is a spiral of State assistance to all and sundry, the good, bad, and indifferent farmers.

"I consider that the true solution to this problem is to be found in keeping all costs down. The position of the marginal man deserves special consideration, and I

believe that various methods can be devised for dealing with his difficulties.

"The State has a definite responsibility to play its part by constructive schemes of re-afforestation, irrigation, erosion control, etc. I want to emphasise the necessity of preserving our natural resources in New Zealand. The land is our heritage. We have a duty to succeeding generations to preserve the quality of the soil. I would like to throw out the suggestion that farmers give serious consideration to conferring with the Government of the day concerning the full use of available machinery for this purpose. As a practical suggestion I would advocate an understanding for the establishment of mobile machinery units in each centre to put in crops, to reap them, and to save hay and silage. If this were done, we could probably double the amount of hay and silage saved, and thus more than offset any deficiency in fertilisers.

"All these things will help, but the point is that the holding down of costs in general will make the whole problem of helping the marginal man much simpler. It will enable State assistance to be directed to those who need it most, and not wasted on those whose position is already sound.

BULK-PURCHASE NEGOTIATIONS IN THE BRITISH MARKET

"The question of markets for your produce is naturally one of great concern to you, as it is to the country as a whole. Because of the current scarcity of foods, we should not forget the position that existed prior to 1939. Pre-war, the reports to hand at the time revealed that our market for dairy produce in the United Kingdom was fully absorbed. We were in fact dependent for our prosperity on the state of employment in England and the standard of living enjoyed by England's workers.

"We should remember that with the possible exception of purchasers of lamb, it is the workers of England who are our customers—not the wealthy people and the professional classes, who prefer the home-grown and Irish produce, but the ordinary man in the street, who in past years was subject to periods of sharp unemployment and consequent fluctuations in his living standards. It is the aim in Great Britain today to banish those fluctuations in the standard of living, both by internal measures and by schemes of international co-operation for the attainment of an expanding world economy based on greater production, consumption, and international trade. This does not mean, however, that the British working man will want to buy New Zealand butter at 2s. a pound. Britain must have cheap food if she is to survive as an exporting country. I know that negotiations are at present in progress in London concerning the prices to be paid for New Zealand produce under bulk-purchase contracts. I do not venture to predict what the outcome will be, but I can say this much: that it is no use building up an inflated cost structure in the dairy industry in New Zealand and then trying to claim a price from Great Britain sufficient to cover it at any level. Even if we were successful in such a negotiation, it would only be a temporary success, since high prices for a basic foodstuff would lead to a contracting market. Our trade negotiations with the United Kingdom should not be based on inflated costs of production, but on the relationship between price levels affecting trade between the two countries.

ALTERNATIVE MARKETS

"We must not ignore, too, the changes which have occurred in the Empire and the world because of the war; or, possibly, it would be more correct to say that the changes have been accelerated by wartime conditions. The position of India deserves our most careful attention. With the attainment of a large measure of political and economic freedom, it is reasonable to say that the Indian people will make greater efforts to raise their standards of living, and we know that there is an enormous industrial potential in that country. Other Eastern countries, which for centuries have known the hand of poverty, are now beginning to improve their economic status.

"Taking the long view, I suggest to you that we should look towards these peoples as potential customers. Britain has been and may remain our best customer, but it is good business and in no way unpatriotic to suggest that we should now look towards our nearer neighbours in the East for an expansion of our trade. Australia is already active in this field, particularly in the direction of marketing manufactured goods. New Zealand should be there, too, promoting marketing opportunities for our primary produce.

STABILISATION POLICY AND MARKETING PLANS

"Stabilisation policy, allied in the case of the dairy industry with the guaranteed price procedure, has given our primary producers security in marketing for a number of years. Stabilisation policy for farming was linked with an assurance that prices would not be allowed to fall below 1942 levels. In addition, the State assumed the responsibility of marketing total production in some cases, e.g., apples and meat. Farmers thus received assured markets and prices. The meat industry has built up reserves which will ensure that this security is maintained for a further long period.

"I would like to quote to you figures showing the estimated position of the meat and dairy accounts as at July 31 this year:—

Position of Stabilisation and Pool Accounts.

	Estimated balance as at July 31, 1946.
	£
Dairy Industry Stabilisation Account	4,000,000
Meat Industry Stabilisation Account	3,500,000
Meat Pool Account	8,500,000
Meat Stabilisation **plus** Meat Pool A/c.	12,000,000

"The meat industry has thus a reserve of £12,000,000 set aside. In the case of dairy, the figure is £4,000,000, but at the beginning of the war the Dairy Industry Account was in debit to the extent of about £2,000,000. The present improved position is the result of security in marketing.

"But I can recall, and you will recall, too, from your experience, times when the marketing of primary produce meant insecurity. Prices would fall while produce was in transit and farmers would receive a return that was in no way comparable with the costs of production. The fantastic situation arose that, at the beginning of a season, a farmer would be given a small advance on his produce, but at the end of the season, instead of having a balance to collect, he would have to pay back some of the original advance. Practically everyone has seen that happen. This unplanned method of trading can result only in insecurity and, if continued long enough, in final chaos. A good farmer, a man who looks after his land well, should not have to contemplate leaving that land just because of market fluctuations overseas.

"I believe your industry is seized with the importance of this problem and I know that the Dairy Board has submitted proposals to the Government dealing with this very question. It would not be proper for me to comment on these proposals, but speaking generally I would like to say that in my opinion a marketing plan must offer reasonable security to efficient farmers and must at the same time make provision for the setting aside of adequate sums as a reserve against falling markets overseas in order to avoid the farmer becoming a burden on the State. For example, it would be unsound to fix prices too high in the first instance. To pay out to the maximum in the

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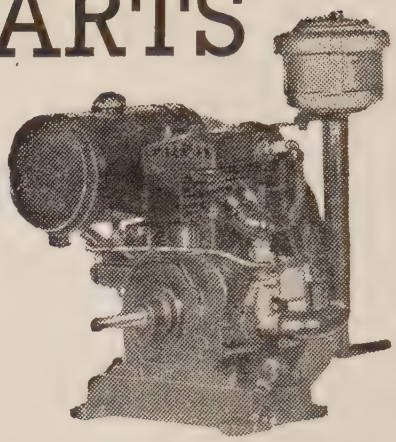

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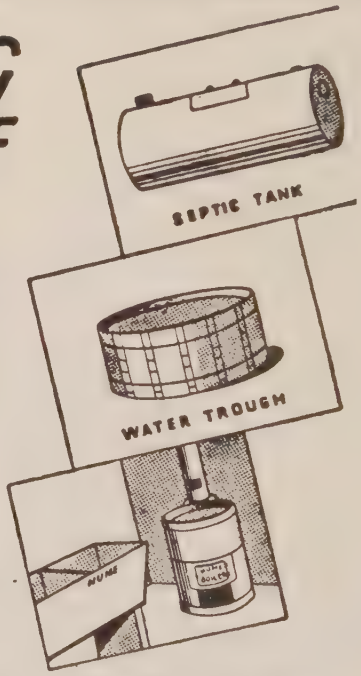

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good years now and leave nothing in reserve to meet an unpredictable future would be irresponsible on the part of the industry and a possible disaster to the economy of this country.

"It would be short-sighted for the dairy industry to use up all its receipts in good years for current spending, and then clamour for State assistance in the bad years. Such a course would not only lead to hostility from all other sections of the community, but, worse still, it would be economically unsound from the country's point of view. I am sure that no one in the industry would seriously advocate such a policy, and any marketing plan must be examined to ensure that no such situation could arise under it.

"It is true, however, that under the guaranteed price ultimate security to the dairy farmer is a responsibility of the State. For the reasons I have just mentioned it is a concern of the industry as well as the State to see that no unsound position could arise. This joint responsibility and indeed partnership of the State and the industry makes it simply a matter of logic that they should act together on matters concerning the sale of their produce.

SECURITY UNDER THE GUARANTEED PRICE

"The evidence discloses that the dairy industry has enjoyed a 10-year period of prosperity unequalled in the history of the industry. The figures show that payouts, including cost allowances, have risen over the whole of this period, and I am satisfied that no one can claim that under reasonably efficient management there was any farm that could not be run profitably. The fluctuations in butterfat payouts in the period before guaranteed prices began are well known to everybody. During the first world war the butter factory price per lb. rose from 13.81d. in 1914-15 to 33d. in 1920-21. In the following season that figure was halved to 16.5d. and a period of fluctuating prices followed which culminated in a fall to 8.75d. in the bottom of the 1933 depression. There is a striking contrast between that story and the story of gradually rising payouts in the last 10 years. The following are the Dominion average payouts for butterfat for butter under the guaranteed price:

Dominion Average Payouts under Guaranteed Price.

Year.	Butter factory price. d. per lb.
1936-37	13.558
1937-38	14.812
1938-39	16.087
1939-40	16.179
1940-41	16.106
1941-42	16.017
1942-43	16.569
1943-44	17.597
1944-45	19.790
1945-46 (est.)	20.6*

(* Estimate by Marketing Department at commencement of season.)

"The figures include cost allowances which have been granted after consultations between the Government and the industry and which have ensured a stable relationship between prices and costs.

"The guaranteed price has succeeded in putting farming on a sound basis. The farmer's returns are provided for except in abnormal circumstances such as droughts or floods. A man working a farm of 50 to 100 cows and running it efficiently can tell you within 5 per cent. what his income would be in any year. This is particularly important in the vital case of new land being developed. Without this assurance the venture would be a gamble and a prudent farmer would be over-cautious about this expenditure in developing new land, since he might find himself in debt to the bank at the end of the year. The guaranteed price is the ideal method of enabling an extension of dairy farming.

"In speaking of the guaranteed price I would like to say something about the labour reward as set out in the existing cost structure. This structure is based on the case of two men milking 48 cows. I think that was a very favourable deal for farmers. I would go so far as to say that in its negotiation with the Right Hon. Mr. Walter Nash the dairy industry has really got the better of the deal. For you gentlemen know that in most instances two men milk more like 60 to 80 cows. I ask you, is it fair to load the cost structure in that way, and leave the matter there? Technical improvements since 1937 in machinery and non-stripping have also changed the situation and the structure is now out of date. My colleague and very wise old friend, Mr. William Marshall, had something to say on this point at the National Dairy Association conference last year. He found it necessary to issue a warning on the danger of urging revision of one part of the standard only, e.g., the 250lb. per cow standard. He said, in effect, that opening up the question of this one standard would open up the question of other standards which might react adversely to the farmer's interests. It would appear that Mr. Marshall was nervous about the labour reward being too high.

PRODUCTION IN THE WAR YEARS

"I am not forgetting that there have been difficulties in the supply of labour and of many commodities such as fertilisers, but these were the inevitable concomitants of a world war. At the peak period of mobilisation in 1942 Armed Forces plus casualties accounted for 170,000 men, or almost 30 per cent. of the male working population. It is estimated that farming industries contributed a total of approximately 20,000 men to the Armed Forces, or about an eighth of the pre-war farm labour force; this affected dairy production particularly, since losses from other types of farming tended to be offset to some extent by Army assistance (e.g., the harvesting scheme). The industry responded magnificently and overcame difficulties in a way which has earned the gratitude of the whole country. I want to express appreciation of the work which was carried on during the war years by elderly people, both men and women. These people had earned their rest, but carried on for the sake of keeping up our wartime production. The industry may feel that its own reward lies in the sound position which it has attained generally, but particularly in the financial security of the thousands of individual farmers.

STANDARD OF LIVING IN NEW ZEALAND FARMING

"To gauge the prosperity of any industry or nation one has to go to the homes of the people. I venture to say that in no other country of the world do dairy farmers or farmers as a class enjoy a higher standard of living than they do in New Zealand, and in no other country do they enjoy the economic security, the freedom from fear of dispossession which they have experienced in New Zealand for the past decade.

"Further, in no other country do farmers have the advantage of the amenities which have been provided for them in New Zealand. Electrification covers 95 per cent. of the industry. Our rural education facilities are unequalled. Buses travel from farm to farm taking children to and from schools. The Country Library Service is available to all. Free boarding allowances are provided for country children attending schools for higher education. Free university education is obtainable by country as well as town students, and two university colleges, Massey and Lincoln, concentrate exclusively on agriculture. In addition, a splendid service of instruction and assistance is provided to farmers by the Department of Agriculture.

STABILISATION AND THE FARMER——

THE FINANCIAL POSITION OF FARMERS

"It is the experience of the ordinary man which is important and the experience of the ordinary dairy farmer in New Zealand over this period has generally been one of assured returns and a gradual but consistent reduction in indebtedness. This is the story told by the mortgage and bankruptcy figures. Taking the bankruptcy statistics for an example, the position is as follows:

Bankruptcies.

	Total bankruptcies (average number per year).	Farming bankruptcies* (average number per year).	Farming as per cent. of total.
1920-24 ..	503	137	27.2
1925-29 ..	753	142	18.9
1930-34 ..	613	101	16.5
1935-39	251	20	8.0
1940-44 ..	111	8	7.2

(* i.e., straight-out farmers, including sharemilkers, but excluding market gardeners, etc.)

"These figures disclose that, as the stability of the industry has improved, not only has the annual number of farming bankruptcies dropped to a negligible level, but the proportion of farming bankruptcies to the total has consistently diminished. It would appear that farmers are finding it increasingly difficult to go bankrupt. In 1945 four farmers went bankrupt, and in 1944 only two qualified.

IMPORTS AND SECONDARY INDUSTRIAL DEVELOPMENT

"I spoke earlier of our market relations with the United Kingdom in relation to the export of our primary produce. We have also to consider the other side of the story, the importation of goods into New Zealand. During the past few years there has been an enormous development in secondary industry in New Zealand. I want to say first of all that I believe we should foster secondary industry in New Zealand, particularly those industries which lend themselves to our conditions and are perhaps allied to our primary production. The test is largely one of determining what secondary industries we need to give employment to our people and to maintain a reasonable balance between our rural and urban life.

"We must realise, however, that we are industrially a poor country. We have, for example, no minerals that are suited for large-scale industrial development, nor have we any nearby markets to which we can export finished goods. Therefore, we must be clear as to the part which secondary industries are to play in our economy, and I can make my views clear by distinguishing between the short-term and the long-term situation. In the short-term we appear to have reached the position where our secondary industries are afflicted by a manpower shortage, and some might say that we are getting over-industrialised in lines of goods which are selling at an uneconomic price in relation to imports and which have no relation to our natural resources. But in the long-term view the question of relative prices is only one factor, and a real test cannot be made entirely on these grounds. Of fundamental importance is the provision of employment for our rising population, and the problem is one of striking a balance between the material resources and the labour available.

"Whatever part secondary industry is to play in our development, we will always need large importations of consumer and capital goods from overseas. We have pressing needs for capital goods for our transport services, for hydro-electric development, and for the adequate maintenance of farm and factory equipment and many other lines. You will appreciate that the building of railways, roads, bridges, and power supply facilities has been a major factor in the development of farming efficiency. These factors and the application of advances in the scientific and mechanical fields have revolutionised work on farms and eliminated needless drudgery. The continuation of this progress is dependent upon an adequate flow of imported commodities and equipment.

THE LIMITED AMOUNT OF STERLING BALANCES

"Although our sterling balances appear high, it is questionable whether they are adequate to meet all our requirements were the goods available to purchase overseas. This points to the need for continued control over our overseas funds so that the most urgent and nationally important needs may be met first. The internal purchasing power at its present high level would exhaust our overseas resources in a short time were import control to be removed.

"In my report to the National Council of the New Zealand Federation of Labour earlier this year I stressed the fact that we have not unlimited sterling funds available for the purchase of imports. The funds which stood to our credit at the end of the war have already been considerably reduced by debt repayments, and I would draw your attention to the fact that, as part of the United States-United Kingdom loan agreement, the United Kingdom is called upon to approach her sterling area creditors, including New Zealand, with a view to achieving a downward adjustment of sterling balances held in London and a virtual immobilisation of a large part of such balances. Such a procedure would make our supply position for imports even more severe, and would emphasise the necessity of using our available funds to the best advantage. We cannot afford to reduce the sterling funds available for imports by further debt repayments. It stands to the credit of the Government that it has met the external cost of the war in full, but even now voices are being raised in London suggesting that when future debts fall due they should be met by conversion operations. This in itself is a tribute to the financial standing of our country. In our present circumstances I personally am in agreement with that view, provided the conversion terms are to our advantage.

THE REMOVAL OF ECONOMIC CONTROLS

"There are a number of people who are advocating the removal of all economic controls. They say that 'only in a free market will production be stimulated.' The production of what? one may ask. We would be flooded with luxury goods, provided with luxury services, but who would guarantee to provide the essentials of life within the price reach of every man in this country? Would we as a nation produce the essential commodities that are required in such abundance by the starving and destitute countries overseas? It has been my experience on the Stabilisation Commission that there has been a constant drag against controls not towards the production of more essential goods, but always to gain opportunities for the production of luxuries that are not essential to our life. In the absence of all controls in today's circumstances people would rush into the production of luxury lines which showed the best profits. I have heard such people described as 'the pied pipers of profit, leading the people to destruction,' and I think it is an apt description. There will be a time when we can afford and enjoy luxuries, but that time has not arrived when we are still short of many of the essential needs of life. If further answer is needed, then I would say that the conditions of a free market do not exist in the world today, nor are they likely to exist for some time to come.

BOOMS AND SLUMPS IN THE ECONOMIC SYSTEM

"Again, we hear it said that booms and slumps are necessary to the proper functioning of the economic system.

This is irresponsible thinking and speaking of the worst description. Booms enrich the speculator and impoverish the small man, be he farmer or worker; slumps drive even good farmers off the land and depress the working people, the ordinary men and women who comprise the nation, into unemployment and hunger.

"In the depression production was high and food plentiful, but money to buy it was lacking. The farmer was put on a budget by stock and station agents and the banks. He was told what he could buy. The mortgagee used to be ever on his doorstep. If his wife appeared in a new dress, even if she had made it herself, the mortgagee asked questions. The amount the farmer spent on food was questioned. It is appropriate to recall that the 1934 Dairy Industry Commission reported that over half the farmers in the dairy industry were unable to meet their commitments. These are not the necessary counterparts of an economic system; they are but the excrescences which show that an economic system is at fault.

"One of the things which was most at fault was the money system, including the system of interest rates. Mortgages carried interest rates which were beyond the capacity of farmers to meet. And for many of those which carried the highest interest rates the mortgagee would not accept repayment. Farmers as a group began to level severe criticism at a monetary system which affected them so adversely. The first step in the liberation of the financial mechanism was taken when the Reserve Bank was established by the Coalition Government. Since then the extension of the State's power to control money and credit has meant a progressive lowering of interest rates. This has been to the benefit of farmers, and interest rates can now be held stable. No one wants to go back to the old system of boom and slump finance.

ECONOMIC UNREST IN OTHER COUNTRIES

"We in New Zealand should reflect on the conditions which exist here and in other parts of the world. The prevalence of industrial disputes is a useful barometer with which to measure the economic stability of a country. We have had industrial troubles in this country, but viewed in their perspective in comparison with other countries they have not been of great significance. One has only to make a comparison with Australia; and certainly no one would suggest that our troubles are as serious or so profoundly disturbing as the industrial troubles which the United States of America has experienced in the last few months. That is not said to excuse strikes in New Zealand, but to make the point that industrial strife is an indication of unsound economics. The American people were in a hurry to rid themselves of controls, to return to a free economy despite the advice of their economic experts, and they are today paying a terrible price for their haste. The people of New Zealand are orderly. I may be excused in pointing out that this is not only because our economics are sound, but because of the sound policy of the New Zealand Federation of Labour in always encouraging the settlement of disputes by negotiation.

"Different groups in the community work together in a co-operative spirit. I will give you an instance of the type of co-operation which exists between industrial workers and farmers. I have the honour to be president of the New Zealand Seamen's Union, and our organisation has a rule that if any member is found guilty of stealing on board a vessel or of interfering with cargo in transit, he is expelled from membership of the union. Thus our union not only pays lip service to the idea of co-operation, but gives practical application to it in protecting the farmers' goods in transit. This rule has been given effect to.

"The security of livelihood that is the human right of every individual cannot be attained by paying lip service to the ideal of freedom. Too often the reality hidden behind the misuse of that word is enslavement of the people to poverty.

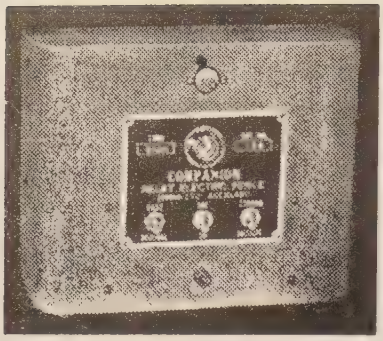
"We have every reason to hope that such a state of affairs will not happen in this country, but we need more than hope. Today as never before we need to put forward our best efforts in production—farmers, manufacturers, and workers. Our standard of living is measured in the terms of the goods and services we ourselves produce—not in the amount of money we have in the bank or our prospects of credit. We must have more goods and services created by the efforts of our own people if we are to remain a prosperous and virile country.

THE FUTURE OF STABILISATION

"I wish to appeal for closer understanding between the farmer and the industrial worker. We have all of us the one interest at heart, that is the prosperity of our country and ever-improving standards of living for all of our people. I recall with pride that the introduction of a full stabilisation programme was made possible because farmers, manufacturers, and workers were able to sink their differences and find a common approach to our economic problems. That this has resulted in benefit to our country there can be no doubt. The only test is that of comparison with other countries, and New Zealand has up to now avoided the most serious of the economic ills which are threatening other countries. The danger today is that we may become complacent. We in New Zealand have one advantage, namely that there are no great extremes in income levels. One of the main concerns of the Economic Stabilisation Commission has been to maintain a proper alignment between wages and farm incomes. The Commission has been constituted in such a manner that farmers have always had representation, and this has been of the greatest assistance. Considering the close identity of the aims of the industrial workers and of the farmers, it would be a pity if anything interfered with the close co-operation between these two groups.

"Within the next few months there is a strong likelihood that irresponsible people will make statements designed to break down these good relationships. I am finishing on this note because I want to leave this thought with you for serious consideration. The stabilisation bargain, which was the foundation of our national economic unity in the war years, was a bargain with more than one side to it. Farmers and workers alike agreed not to take advantage of a sellers' market for their produce and labour. Wage-earners today are still in the position of having a sellers' market for their labour. The economics of the situation could easily lead them into demands for wage increases. But the bargain still stands, and, at its last conference, the New Zealand Federation of Labour reaffirmed its support for stabilisation.

"I am confident that the great bulk of farmers will readily appreciate the value that stabilisation has been to our country and would be happy to observe their side of the bargain. Unless all parties adhere to the stabilisation bargain, then we will face a situation where economic groups compete one with the other for temporary advantages. The ultimate result would be a spiral of inflation and the sacrifice of all the benefits we have already gained from the policy of economic stabilisation. Economic stability and security can be maintained if we achieve understanding and co-operation between the major groups. I appeal to you for your co-operation, and for your understanding of industrial labour problems as well as your own position, confident that this is the surest method of safeguarding the welfare of all our people."



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Growing Peas for Canning in Nelson Province

NELSON Province, with its congenial climate, has long been known for the diversity of its farming. In this article D. M. E. Merry, Instructor in Agriculture, Nelson, describes how green-peas are grown for canning, and the modern mechanical methods of handling the crop from field to factory.

THE growing of green peas for both market and canning has been a feature of Nelson farming for many years—indeed it is no idle boast that peas for the domestic trade are picked the year round.

The Waimea Plain and nearby valleys are the principal sources of the main season's supply, for which about 600 acres are grown yearly. Probably more than half of these go to the local cannery and the remainder to open market. In addition 200 acres were contracted for by a cannery last season for supplying the company's viner at Appleby, 13 miles from Nelson on the main Motueka highway. This is a recent development in the pea-growing industry, and as mechanical means can be used from the cutting of the field crops to the threshing out of the peas it is likely to prosper.

Viners are machines of American manufacture capable of shelling peas direct from the plant without the pods being picked off. Two of these machines, permanently housed in a central area where the peas are being grown, serve the district; crops are brought in for distances up to 10 miles.

In essentials viners are not unlike large threshing mills. The green crops are hand forked on to endless conveyors, and beaters thresh the peas from the pods. Peas are collected, screened to remove foliage and extraneous matter, and riddled for sizing. They are then run off into ventilated crates and removed by lorry to the town processing factory with a minimum of delay to be canned in prime fresh condition.

Soils and Growing Conditions

Nelson's Waimea Plain, though small compared with the plain country of Canterbury, is intensely farmed. Soils range from stony, free-draining loams to heavier types, and this largely determines whether the pea crop will be grown for hand picking or for the viner. The stony ground, being the earlier, is favoured for hand-picking crops; the heavier loams are more suitable for the full use of machinery, and consequently for the growing of viner peas.

Peas are nearly always grown in Nelson after a permanent pasture ley, as the fertility is then high and good yields are assured with little or no artificial manures. This also fits in well with general farming conditions. On the lighter soils it is difficult to hold good grasses, and when these are rotationally brought into cultivation they will probably be sown after peas to turnips, red clover for feeding off, hay and seed, or perhaps a cereal crop. Eventually the land will be resown to grass.

On the heavier soils peas are being increasingly used as a preparatory crop for the replacement of deteriorated pasture with high-class sowings, intended for sheep grazing, and later perhaps for Certified seed production. On either class of soil no more than one crop of peas is usually taken, as there is a tendency for land to become "pea sick," with falling yields in succeeding crops.

Growing peas for market has always necessitated early prior arrangements for pickers. The work is largely done by parties of women and children from the neighbourhood, but in the war years they were supplemented by willing workers from the towns. That was an invaluable war effort, particularly as a week or so of wet weather after the peas have podded hastens their maturity, and unless sufficient pickers are available considerable crop losses may occur. The labour factor is the most important in setting the acreage which can be sown to picking peas.

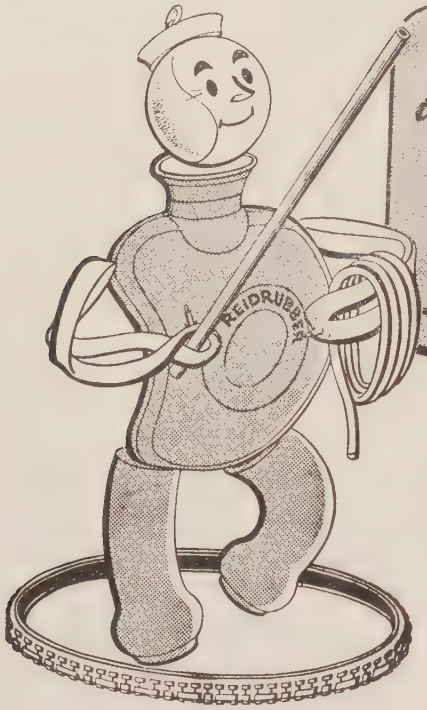
On the other hand, peas for the viner can be brought in quickly, and though they are harvested at a more fully mature stage, there is less likelihood of economic loss. Picked peas for the factory are sold at 1s. a 7lb. peck, and the pickers customarily receive 9d. a four-gallon bucket for their labours. A higher rate is paid for picking market peas, as more selection is required to produce first-class culinary lines. Cannery peas are machine shelled at the factory, an operation involving a weight loss of half or more of the original.

Growing for the Viner

One of the most important factors in growing peas for the viner is the selection of suitable land. The crop does not grow successfully in wet, poorly-drained conditions or where annual weeds are troublesome. Fat-hen, nightshade, and Prince of Wales feather are among the bugbears of viner staffs; not only is the bulk of the crop increased but fleshy weeds make clean threshing difficult, and the berries of nightshade are well-nigh impossible to separate from the sound peas by screening. Picking over by hand is uneconomic.

Land for peas is customarily ploughed out of turf in the late autumn or winter and well worked for sowing from late August through to October. Seed peas of the required variety—Greenfeast in this district—are supplied by the factory, and the normal sowing rate is one sack, or 3⅛ bushels, an acre in 7in. drills. It would be advantageous to pre-dress seed peas with 2 or 3oz. of copper carbonate a bushel to avoid fungal troubles in the early establishment of the crop, particularly if the weather is wet and cold after sowing, but that is not usually done.

Peas for canning sown at different dates to give spread delivery.



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Some farmers drill peas with phosphatic fertiliser, though many rely on the high fertility out of grass and do not use fertiliser. One hundredweight or more of reverted superphosphate is a sound proposition, as is an application of 5 to 10cwt. of ground lime broadcast before sowing. Peas are a lime-responsive crop and such treatment pays handsomely.

Till now the factory has preferred the Greenfeast variety, but it is understood others are under review.

After rain most land compacts. Peas are intolerant of this condition and harrowing once or twice in the direction of sowing, though possibly appearing drastic treatment, checks weed competition and the improved general growth compensates for the few plants lost in working. Light cultivation can continue until the crop has made about 3in. of growth.

Harvesting and Vining

As contract areas approach the correct stage for cutting they are inspected by cannery officials, who arrange the date and time of delivery at the viner. If the crop is standing well—as it should under good establishment and growing conditions—it can be cut without the use of pea fingers on the power mower. By attaching a side delivery rake to the mower, field peas can be windrowed conveniently for later lifting by a green crop loader drawn behind a flat-tray tip truck. Few peas are then crushed or lost. The lorries convey the crops to the viner, where they are tipped on to the concrete apron before the machines in a convenient position to be forked on to the conveyors.

Harvesting viner peas begins in late December, with the main rush in January, which means that the viner is working long hours on shift. The grower receives 2½d. a pound on accepted shelled pea weights, and may take back or otherwise dispose of the trash for feeding or silage. There is a keen demand for this trash.

In the Nelson district green pea weights have ranged up to 3 tons an acre, but the district average is probably between 1 and 1½ tons an acre. In normal conditions the Greenfeast variety returns a good weight of sizeable canning peas in comparison with the total bulk of crop. On heavy land there is somewhat more top to peas, and as all this must be carted to the viner at the grower's expense, other varieties than Greenfeast may be grown in future seasons.

Even at present, however, when the viner has been in operation for only two seasons, it is apparent that growing viner peas will become a profitable part of the district's farming economy, though probably a smaller acreage of picked peas will be grown.

HARVESTING CANNING PEAS

Upper—Harvesting canning peas with a hay lifter. Middle—Cutting and raking the peas into windrows in one operation. Lower—The vines are tipped at the viner.

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SEED MAIZE

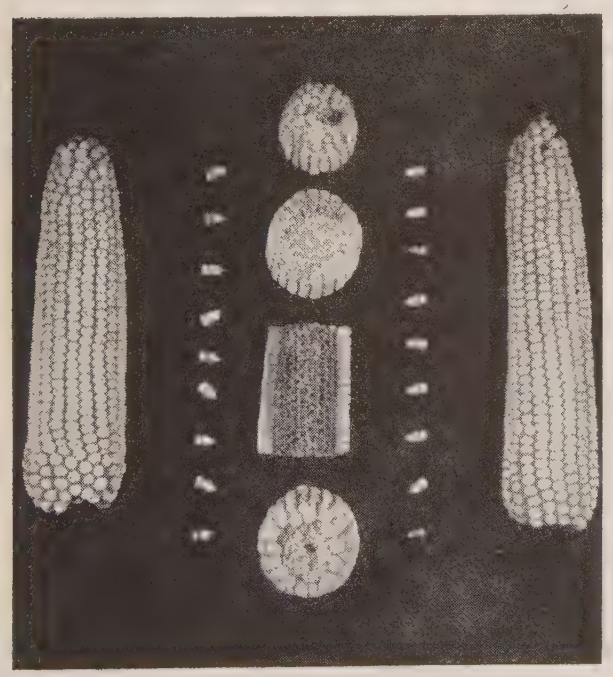
Supplies for 1946 Sowings

By J. H. CLARIDGE, *Agronomist, Wellington.*

IN recent years the maize crop has not been sufficient to meet the demands of poultry keepers and pig farmers, and an urgent appeal for increased production in the 1946-47 season is now made. Apart from any increase in the acreage planted, appreciable increases in yields could be obtained by using the best-quality seed maize available.

The development of hybrid seed maize in America and Canada during the last few years has led to marked increases in yield, while the evenness of the crop and uniformity of the grain are also improved. It is the usual practice there to plant only "first generation" hybrid seed, the whole resultant crop being disposed of for feed purposes.

At Dargaville in the 1939-40 season some seed of Pfister Hybrid No. 360 gave very promising results in comparison with local varieties, but during the war this type of maize was lost sight of by the Department of Agriculture. It came as a surprise, therefore, to find that during the 1944-45 season in Poverty Bay over 1,000 acres were planted with seed produced originally from a bushel of Pfister Hybrid No. 360 imported by an East Coast resident in 1940.



Sparrow Industrial Pictures photo.

Pfister Hybrid maize.

The contract seed crop.

The increase in the acreage devoted to this particular hybrid is evidence of its quality, and indicates that its yielding ability has been maintained although it is now several generations removed from the first generation hybrid stage. Inspection of crops revealed that while the purity of some had deteriorated, others grown under isolated conditions had maintained the type and purity of the cob in a very satisfactory manner.

In 1945 the Department of Agriculture made a cob selection from the purest crop of this type that could be found and arranged for the multiplication of the seed under ideal conditions of isolation. During the growing period the crop has been under observation so that any off-type plants might be removed, while the cobs will also be inspected and any poor or atypical ones discarded. The crop is at present being harvested and promises to yield over 100 bushels per acre. The seed from this crop will be machine-dressed and distributed through the usual mercantile channels as "Government Approved seed maize." While it is not claimed that this seed will be of equivalent merit to the first generation hybrid, it is, on its performance to date, considered superior to the usual supplies of seed maize available in this country.

At present only very limited supplies of first generation hybrid seed maize are available in New Zealand, but negotiations are under way, which, if successful, will result in its production locally. In the meantime the improvement to be derived from the planting of the "Government Approved" seed, of which there are ample supplies, should be availed of by all growers of maize for grain purposes.

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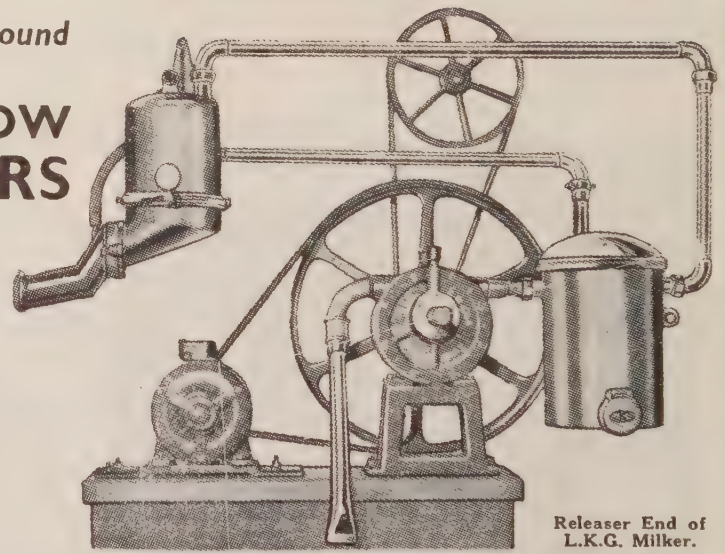

Releaser End of L.K.G. Milker.

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FARMYARD MANURE

Rich Source of Fertiliser Equivalents

By E. H. ARNOLD, *Instructor in Agriculture, Whangarei.*

BEFORE the present century continued farm production was possible only when soil fertility was maintained by a carefully-arranged system of crop rotation. Good farming consisted of growing crops which benefited the following crops and which above all fully utilised the animal droppings. These were returned to the soil either directly by the stock feeding off the crops and short-rotational pastures or farmyard accumulations over the winter were carted out. Stock droppings and farmyard manure were the sheet anchor of soil fertility.

THE advent of artificial manures marked the opening of a new era in farm production. Soil fertility could be raised and maintained economically, crop yields increased, and temporary pastures were replaced largely by permanent pastures. In New Zealand artificial fertilisers are responsible for producing and maintaining the soil fertility that has resulted in our permanent, highly-productive pastures. Although some endeavour has been made by harrowing to utilise more fully the droppings that fall on the pastures, the manure which accumulates at the milking sheds and pig pens has been largely wasted. With fertilisers in short supply it is imperative that every consideration be given to the more complete utilisation of farmyard manure.

Thousands of tons of valuable fertilising material are lost and thousands of tons not used to the best advantage because many farmers drain it away from the milking shed into drains and streams. The solids may lie near the yard until the pile reaches the top rail and something has to be done about it.

It is estimated that the average cow will void each day, somewhere around the farm, about 70lb. of manure. The urine is rich in plant food, containing approximately .58 per cent. of nitrogen, .123 per cent. of phosphoric acid, and .44 per cent. of potash.

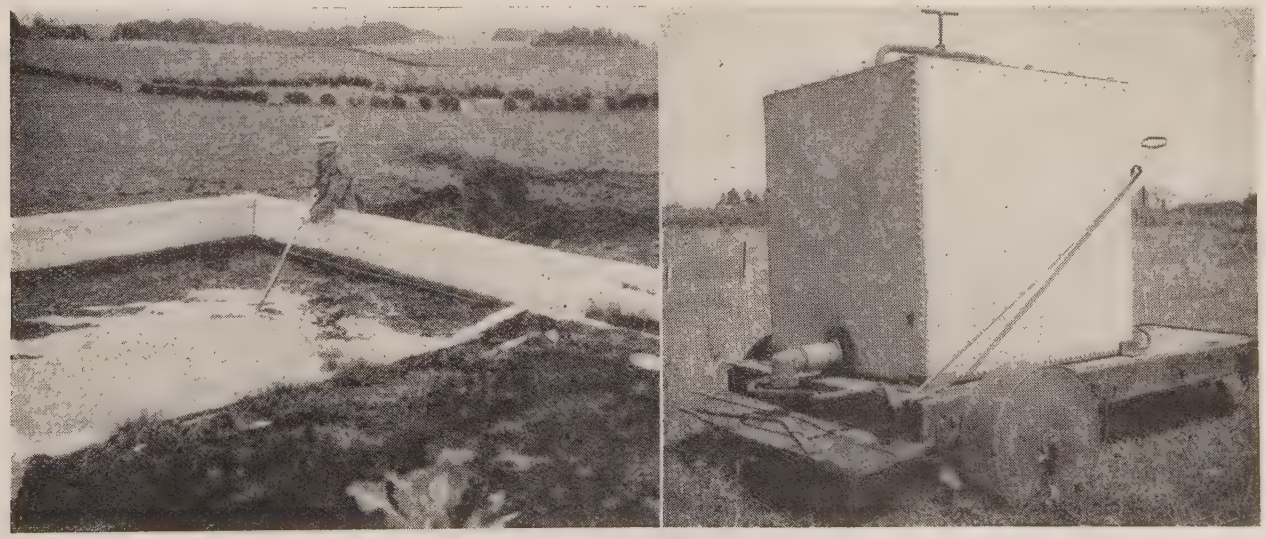
Distribution of Field Droppings

About three-quarters of the total droppings of stock are voided in the grazing fields and returned to the soil. On many farms these droppings are left in compact masses and no endeavour is made to spread them over the land. No farmer would topdress with superphosphate by placing shovelfuls indiscriminately over the pasture. Such a practice would be detrimental, not beneficial. So is the practice of leaving undisturbed cow-pats. Frequent harrowing distributes the droppings and allows of better utilisation.

Value of Manure at Shed

The other quarter of the herd's voidings is deposited in and around the milking shed. Before the war some farmers in Taranaki devised systems of conserving and utilising manure at the milking shed. With the subsequent shortages of fertilisers the practice received a great impetus and has since spread to other dairying districts.

Careful records on two farms in Taranaki revealed that 50 cows produced annually the equivalent of 10cwt. of sulphate of ammonia, 4cwt. of superphosphate, 10cwt. of 30 per cent. potash salts, and 4cwt. of lime. To purchase these materials would cost £18 to £20, and as the cost of installation of the outfit is recouped in the first few years, future costs are of distribution only. At the Northern Wairoa Demonstration Farm, Dargaville, the amount of fertiliser equivalent saved yearly from each 50 cows, based on the records of three years' operations, was 586lb. sulphate of ammonia, 1,510lb. dried blood, 385lb.



Left—A well-constructed sump which utilises gravity flow for the filling of the distributor. Right—An iron tank mounted on a konaki makes a good distributor.

superphosphate, 1,164lb. 30 per cent. potash salts, and 432lb. lime.

Conservation of Manure

Unless the washing-down water is allowed to go into the sump to dilute the manure, and unless the manure is spread evenly over the pasture, there is liable to be trouble through rank, unpalatable feed which the stock will not eat. The liquid manure, diluted but not overdiluted, can be handled and distributed more quickly and easily than the solid manure. No shovelling is necessary and there is no loss of fertilising constituents. The dung and urine are washed into a drain leading into a sump holding the accumulations of from 15 to 25 days, or into a distributor which is emptied every day. The drain is constructed wide enough to take the shed broom freely (about two inches wider than the broom itself) and 6 to 9in. deep to prevent the manure slopping over the edges. A by-pass is required by which the drain to the sump can be cut off, and rain or other unwanted water diverted.

On some farms 6in. or 8in. glazed pipes are used successfully to convey the liquid manure from the shed to the sump. In one instance the material was carried a distance of 84ft. by this method. With this system it is necessary to keep the yard free of rubbish which might block the pipes. Some means to hold the water and manure at the entrance of the drain proves useful in permitting the solids to be broken down thoroughly. The ponded mixture of urine, dung, and water then drains away freely when released. This is especially useful in the summer months.

It is estimated that about two gallons of water per cow are used to wash down the shed and adjoining yards. From a herd of 50 cows approximately 100 gallons of liquid manure are produced each day. Certain farmers have found it advantageous to increase their holding-yard capacity so that after milking all the cows are held in a yard. The fullest use of the manure available can then be made, as in practice it is found that cows void as much manure just after milking as they do before being milked.

The practice of running the liquid manure direct into the distributor has several disadvantages. The distributor must be emptied every day, making a daily tie for a man and the horses or truck. Where a sump is used the material for several weeks can be collected and held for distribution. Where the liquid manure has been subject to the working of bacteria for some time better pasture responses have resulted than where fresh manure has been applied daily.

A sump thus appears necessary for the best results. Under the Dairy Regulations this must be at least 30ft. from the shed or yards. Collection or holding sumps are either concrete-lined, if below ground level, or built with 3in. or 4in. concrete walls and bottom. They vary in capacity from 1,000 to 6,000 gallons. Although some are up to 6ft. deep, it is preferable that the depth should not exceed 4ft. 6in., for when held for some time the solids tend to collect at the bottom and if the sump is too deep it is difficult to stir up the material before emptying. Some farmers have installed sumps with two sections so that there is always well-ripened liquid manure for distribution.

Wherever possible use is made of undulating country for a gravity flow to empty the sump by simply running the material through a 3in. tap into the distributor. On flat country the sump will have to be built below ground level, and a pump is then required to lift the liquid manure from the sump to the distributor.

Several makes of efficient pumps driven by electric motors are on the market. The hand pump, at first used in Taranaki some years ago, has gone out of favour. One good type of outfit consists of a specially-constructed distributor which is filled by the use of a vacuum pump which draws the liquid manure up from the sump into the tank. Under the Dairy Regulations the vacuum pump used for the milking machine cannot be used for this purpose. A separate and usually second-hand vacuum pump has been found successful.

The Distributor

Iron or wooden tanks are used for carrying the liquid manure to the paddocks. Small containers of up to 200 gallons capacity can be mounted on a sledge or konaki. Some distributors are on wheels which, however, must be of large diameter and possess at least a 6in. tyre. For handling large quantities the horse lorry, motor truck, or a tractor-drawn trailer with a larger tank or several 200-gallon tanks is used. The usual practice is to fit the tanks with a 3in. tap of the dairy factory milk-vat type. The tap can be connected by lever arrangements so that the liquid manure can be released by operating a handle near the driver's seat. The liquid manure then drops down about 3in. on to a spreader board or plate, which is usually made out of a sheet of iron. Part of the side of a 40-gallon oil drum is very suitable. Owing to the dilution of the manure, a spread of not more than 6ft. is desirable.

Application of Liquid Manure

A 400-gallon tank with a 3in. tap can be emptied in about four minutes, and with a 6ft. spread will cover 14 chains. It takes 10 such tankfuls to cover an acre thoroughly, and thus the usual dressing will be given at the rate of 4,000 gallons per acre. Stock will graze freely within a week of application, particularly if rain has fallen. Liquid manure stimulates grasses, clovers, and weeds. It imparts a deep green colour to the growth, which is greatly increased. The most marked responses from the application of liquid farmyard manure are observed when a poor, weak pasture sward is treated.

The liquid manure from 50 cows will cover from 10 to 15 acres each year. A beneficial practice is to dress the fields to be closed for hay with the manure available in the earlier part of the season, and those fields to be closed in late autumn for early spring feed with the manure available in the later part of the milking year.

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ANSWER TO CORRESPONDENT

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The information you require on the composition of licks will be supplied on application to your nearest office of the Department of Agriculture.—Editor.

PLANT HORMONES

Results of Experiments

PLANTS have no nervous system similar to that of the higher animals whose actions are controlled by "messages" flashed from a central brain through nerves which radiate to all parts of the body. A plant's activities are controlled by minute doses of chemicals—the so-called "chemical messengers," "plant growth substances," or "plant hormones" which, as it were, carry messages and instructions from one part of the plant to another.

THE discovery of these plant hormones and the work they do is one of the most important advances ever made in the study of the way plants grow. A great deal of attention has been given to the subject during the past 20 years, and it is now possible to manufacture some of these chemicals and use them to control the growth of plants in certain directions. Such hormones are effective only if applied in minute doses of a few parts of the chemical to a million parts of water, for greater doses will usually injure or kill the plants. Moreover, the hormones are effective only if applied at the proper time, in the right way, at correct concentration, and to the appropriate part of the plant. There is still a great deal to be learned about the theory and the practical use of hormones.

Specific Purposes

Despite these limitations various types are now on the market, and the object of this article is to indicate the purposes for which hormones are at present offered for sale and the results of their use overseas and in the Dominion. Several types of hormones are available here, each for a specific purpose:

1. To encourage rooting of cuttings for use in propagating (rooting hormones);
2. To assist plants to recover from the check of being planted out (transplanting hormones);
3. To obtain a good set of tomatoes under adverse conditions (fruit-set hormones);
4. To ensure that certain stone and pip fruits do not fall off the tree before they are ready to be picked (fruit-drop hormones); and
5. To kill certain types of weeds without affecting the crop in which they are growing (weed-killing hormones).

In addition, the use of hormones has been suggested for delaying the sprouting of potatoes, retarding flowering shrubs and trees, producing a more prolific crop of berries on fruiting ornamental trees, producing artificially-incurved chrysanthemum blooms, helping in hyacinth propagation, and for many other purposes. It must be borne in mind, however, that we still know all too little about the plant hormones, and that many of the claims made for proprietary articles apply to their use overseas and have still to be checked by trials under New Zealand conditions.

Much has been said and written in the past few years about the so-called "plant hormones." The principles underlying the use of these chemicals and their present, and possible future, application to garden practice are discussed in this article by J. P. Hudson, of the Horticulture Division. A further article on the subject will appear in next month's "Journal."

Black currant cuttings taken in early summer from new growth and rooted in a cold frame. That on the right received hormone treatment, that on the left did not. Soft-wood cuttings usually respond best to hormones. The top leaves should be left on the cuttings and the lower ones removed.

Rooting Hormones

When a piece is cut off a plant and made into a cutting, it must either reroot within a certain time or die, and, of course, the more quickly it can be made to root the less will be the chance of its dying. It has long been known that cuttings will root only if provided with the three essentials—air, moisture, and warmth. These conditions can best be provided in glasshouses, especially in propagating pits (low, glass-covered frames within the glasshouse proper), where warmth can be applied, the atmosphere and soil are prevented from drying out by the glass on top of the frame, and the sand, soil, or compost is sufficiently porous to admit air to the rooting surface. Under these conditions cuttings of many garden plants, taken at the right time of the year, will root readily and rapidly. Under less suitable conditions—for instance, in a cold frame (where conditions may be too cold) or out of doors (where the atmosphere may be too dry or the soil too cold)—the cuttings may root with difficulty or not at all.

It has been known for a number of years that certain plant hormones can be used to hasten rooting of many garden plants. This is of great importance to both the nurseryman and the amateur gardener. The professional propagator, who is already providing his cuttings with ideal conditions for rooting, may be enabled to root a much larger number of cuttings a year in a given space. The amateur, with limited or less suitable facilities, may have been able to strike only those cuttings which root most quickly, as he may not have been able to keep difficult subjects alive until they rooted. By using hormones to accelerate rooting, it should be possible to increase the range of plants which can be rooted in a cold frame or out of doors.

The rooting hormones have been used in a variety of ways, including application to the cut surface as a paste, soaking the cuttings in a very dilute solution for 12 to 48 hours, watering the soil with the solution before or after the cuttings are inserted, dipping the cuttings in a wet slurry made of clay and hormone, and, most recently, dipping the cut end of the cutting into a powder containing

the hormone. The last method is undoubtedly the most convenient. If the end of the cutting is so dry that powder does not adhere, the cutting should be dipped in water first.

It has been suggested that shrub and tree species which are very difficult to root as cuttings might be rooted by injecting hormone solution into a branch, or rubbing the surface of a shoot with the hormone, and not cutting the shoot off the parent plant until young roots show on the treated places.

Generally, the effect of using hormones on plants which show any response at all is that a higher proportion than normal of cuttings root, the cuttings develop more roots each, and the roots develop more rapidly than usual. Cuttings treated with hormones often produce roots freely from the sides of the bottom inch or so of stem as well as from the cut surface.

Time for Propagating

The best time for propagating with the aid of hormones varies with different types of plants. Cuttings of herbaceous plants and soft-wood cuttings of shrubs are usually best taken in spring, half-ripe cuttings of shrubs from midsummer to autumn, and hard-wood cuttings in autumn or winter. Hormones appear to be most effective when applied to leafy shoots, and least effective on hard-wood deciduous cuttings taken after the leaves have fallen.

No leaves except the bottom one or two should be removed from cuttings to be treated with hormones. It does not appear to matter greatly whether the cut is made immediately below a bud, or whether it is made carefully with a sharp knife or more roughly, as with sharp pruning shears. Leafy cuttings must not be allowed to flag before they are put into the hormone solution, or they may not take up sufficient of the chemical.

The principal benefits likely to result from the use of rooting hormones are thus:

For the nurseryman—a more rapid turnover.

For the amateur—an increase in the range of plants which can be propagated.

When more is known about the use of hormones it may be possible to produce from cuttings many plants which at present have to be propagated by budding, grafting, inarching, or layering.

[*Photo News.*

Sage cuttings root easily in summer but less readily in winter. These were rooted in midwinter in a cold frame in Wellington. The cutting on the left was given hormone powder treatment; that on the right was untreated.

The effects of rooting hormones can be summarised as:

1. **Nearly all cuttings which normally root easily will root even more quickly and easily, or will root under much less congenial conditions;**
2. **Cuttings which are normally difficult to root may root more quickly in some cases, but in other cases do not respond; and**
3. **Cuttings which are normally impossible to root will rarely root with hormone treatment.**

Transplanting Hormones

As the rooting hormones may be used to encourage root growth on cuttings, it was naturally thought that hormones might be used to help plants to recover from the shock of being transplanted. At the same time it was reported in America that small quantities of vitamin B1 led to more rapid growth. It was suggested that a combined treatment with rooting hormone and vitamin B1 might help transplanted plants to reroot and grow more quickly; but there is little evidence, either from overseas or from small-scale trials in New Zealand, that such a mixture has any beneficial effect.

On the other hand, there is now a good deal of evidence from trials in England that seedling plants recover much more quickly if transplanted at the earliest possible moment, as soon as they can be handled, than if left until they have "developed a good root system" before being transplanted.

REWORKING PIP FRUIT TREES

Trend of Growers' Preference

By R. E. BINFIELD, *Fruit Standardisation Officer, Wellington.*

THE trend in the commercial orchards of the Dominion, and the preference shown by growers in the choice of scion varieties of apples and pears when reworking trees, are shown in the statistics given in this article.

DURING the six years 1940 to 1945 41,539 trees were reworked—36,278 apple trees and 5,261 pear trees. The totals of each kind reworked annually during this period are:—

Year.	Apples.	Pears.	Total.
1940 ..	5,687	690	6,377
1941 ..	14,052	1,383	15,435
1942 ..	6,694	832	7,526
1943 ..	3,009	1,020	4,029
1944 ..	2,952	1,062	4,014
1945 ..	3,884	274	4,158
Totals ..	36,278	5,261	41,539

Many reasons can be put forward for the reworking of fruit trees which takes place each year, any one of which has been sound enough to convince the growers concerned that it would be advantageous from the point of view of production, financial returns, orchard management, or disease control to carry out a programme of reworking unprofitable trees to varieties considered more suitable to their requirements.

Outstanding Preferences

The records compiled during the period mentioned show that certain preferences are outstanding in the scion varieties chosen for both apples and pears, as the statistics on this page will indicate.

From the statistics given it is apparent that:—

1. **"Unpopular" varieties have been gradually reduced.**
2. **The number of trees of "first early" varieties has been reduced.**
3. **Cox's Orange Pippin and Delicious varieties are being gradually reduced.**
4. **Gravenstein, Granny Smith, and Golden Delicious apples, and William Bon Chretien pears, are the most-favoured scion varieties.**

Many of the varieties reworked come within the low price groups of the present marketing scheme; they have been found by growers to be uneconomic to handle and are therefore being eliminated.

Trees of the Cox's Orange Pippin and Dunn's varieties have shown a decided decrease; both have been found difficult to grow in most instances because they are susceptible to blemish and cracking, as well as being spray sensitive, which necessitates careful treatment during the spraying season. The average yield a tree of Cox's Orange is relatively low in some districts, and Dunn's are recognised as biennial bearers, which brings the average annual yield down in comparison with other commercial varieties.

Fewer "First Early" Varieties

The gradual reduction in the "first early" varieties is regrettable from the point of view of supplying the market until Gravenstein are fit to market as dessert apples. Gravenstein is usually a good cropper of high quality and is exceedingly popular with the public as a dessert apple.

A definite preference is shown for Gravenstein, Golden Delicious, and Granny Smith apples in place of Cox's Orange, Dunn's, and Delicious; Williams Bon Chretien pears are preferred to Winter Cole, Winter Nelis, and P. Barry. The decided increase

APPLES

		Total Trees
Trees reworked		36,278
Number of known varieties: 80 totalling	34,700	
Unknown varieties total	1,578	
		36,278
Ten principal varieties reworked:		
Irish Peach	319	
Worcester Pearmain	2,330	
Cox's Orange Pippin	3,496	
Dunn's Favourite	8,607	
Jonathan	877	
Delicious	8,522	
London Pippin	1,592	
Sturmer	768	
Statesman	2,505	
Dougherty	281	
	29,297	
Other trees reworked include 70 varieties totalling	6,981	
		36,278
Scion varieties chosen		36,278
Number of varieties: 48		
Ten principal varieties:		
Gravenstein	5,384	
Ballarat	1,863	
Golden Delicious	6,372	
Granny Smith	8,677	
Giant Geniton	1,065	
Frimley Beauty	1,440	
Rome Beauty	2,085	
Sturmer	1,144	
Tasma	1,783	
Dougherty	979	
		30,792
The 38 other scion varieties chosen	5,486	
		36,278

PEARS

		Total Trees
Trees reworked		5,261
Number of varieties: 27		
Six principal varieties reworked:		
Beurre Bosc	156	
Doyenne du Comice	199	
Josephine de Malines	676	
P. Barry	747	
Winter Cole	1,519	
Winter Nelis	832	
	4,129	
The 21 other varieties total	1,132	
		5,261
Scion varieties chosen		5,261
Number of varieties: 11		
Five principal varieties:		
Clapps Favourite	120	
Louise Bonne de Jersey	128	
Packham's Triumph	483	
Winter Cole	372	
Williams Bon Chretien	4,070	
	5,173	
The 6 other varieties total	88	
		5,261

in the Williams Bon Chretien variety has no doubt been induced by the demand for this variety for canning and bottling, for which it has proved very satisfactory. Gravenstein is a popular "second early" and indications point to it maintaining its popularity, providing it is marketed as a dessert apple in a proper state of maturity and definitely branded as culinary when sold earlier.

Golden Delicious is also a prolific bearer and strong grower whose fruit develop a sweet and pleasant flavour if not harvested too soon. Its defects are susceptibility to black spot and ripe spot, which necessitates careful study of spraying schedules to effect control.

Granny Smith has found its way into most commercial orchards, as it has proved profitable; the fruit is easy to handle and carries well. Its principal defect in storage has been largely overcome by the use of oil-impregnated wraps. The tree is robust and crops well.

Ballarat, Frimley Beauty, Rome Beauty, Sturmer, Tasma, Dougherty, and Giant Geniton all show decided increases.

Choosing New Variety

When deciding on a programme of reworking, the grower's problem today does not lie in the practical operation of grafting but in a decisive choice of the most suitable scion variety. Consideration must be given to efficiency in spraying and disease control as well as in orchard management by arranging as far as possible for an even flow of fruit during harvesting and packing, which will keep the labour employed full time and obviate a rush of work in the orchard and packing shed when handling mid-season and late varieties.

The future demand for certain varieties on both export and local markets is a factor which must receive some consideration, though no sound forecast can be made. Climate and soil types show variations between districts which may affect the productivity of any one variety, and local enquiries may prove of value to the grower who is contemplating reworking any number of trees.

Most Reworking in Nelson Province

An interesting feature from an analysis of the district returns of pip fruit trees reworked during 1940-45 is that more than half of both the apple and pear trees reworked were on orchards in Nelson Province; the totals are 18,928 apple and 2,699 pear trees, of which 14,974 apples have been reworked to Golden Delicious, Granny Smith, Gravenstein, and Tasma, and 2,396 pear trees to Williams Bon Chretien.

Early Spring Harrowing of Pastures

By E. R. MARRYATT, *Fields Instructor, Whakatane.*

THE whole object of topdressing pasture with phosphates is to obtain more "stock" nitrogen for all the grasses in the pasture through the media of more clover, more grazing by stock, more droppings by stock, and the even distribution of the solid portion of these droppings to all the grasses of the pasture. Where they are not spread efficiently, there is danger that grass farming will be less efficient and expenditure on phosphate will give lowered returns.

NEGLECT to spread by harrowing in the early spring stock droppings which have accumulated during the winter is a waste of irreplaceable "stock" nitrogen and a direct means of bringing about rapid deterioration of the pasture sward. Patchy, rank, unpalatable growth, killing-off of some of the grasses and clovers, and an increase of weeds generally result. What can be the profit from expenditure on topdressing a pasture to increase its production if by neglect in another direction a considerable proportion of what is produced will not be eaten because it is not palatable?

An estimate of the fertiliser value of the droppings of one cow during the winter is as follows:—

¼cwt. of superphosphate costing about 1s. 3d.;
¾cwt. of sulphate of potash costing about 22s. 6d.; and
1½cwt. of sulphate of ammonia costing about 30s.

This totals 2½cwt. of fertiliser, which would cost about £2 13s. 9d. per cow if these fertilisers were freely obtainable, but they are either rationed or unobtainable.

The fertilising ingredients in animal droppings are also more readily available as food to plants than are those in most purchased fertilisers. In other lands where cattle are stalled the greatest care is exercised to see that the best use is made of all stock droppings, but in New Zealand their great value is not so generally recognised, as the accumulated droppings near to the majority of cow-yards and unspread droppings in many pastures testify. Under our system of farming the distribution of droppings is very simple because they have already been dispersed in small proportions over the pasture by the grazing animals. All that is required is better spreading.

Harrowing to spread droppings in the early spring is a means of increasing production. Many farmers recognise this, and manage their pastures accordingly, but an appreciable number of fields which display many patches of dark-green growth neglected by stock testify to the waste which can still be prevented.

TREE FELLING AND SPLITTING

By I. L. ELLIOTT, *Assistant Superintendent, and* N. M. PARKINSON, *Overseer, Soil Fertility Research Station, Hamilton.*

AT some time or other on most farms it is necessary to fell and split a tree for firewood or posts or to dispose of a mature tree which has become unsafe. In this article, based on a long experience of this work, sound tree-felling practices which may be known to relatively few but which will be helpful to many are described.

A GREAT deal of individual preference exists on the question of what tools should be used and what weight of axe most suits any particular person, but the following tools will be found suitable for most occasions:—

Showing the different balance of the tree illustrated above after a side branch has been lopped off. This greatly eases the felling of a tree against its natural lean.

The Axe

For general purposes a 4lb. axe will be found most useful. When the handle is laid flat on the hands, the right hand 4 to 6in. from the head and the left hand a similar distance from the end of the shaft, the head of the axe should remain in a horizontal position as illustrated in Fig. 1. An axe which behaves in this fashion is termed well balanced and does not have to be gripped so tightly as an axe whose face drops nearly or absolutely to the perpendicular (Fig. 2). Gripping an axe tightly causes blisters and jarring of the hands.

When selecting an axe care should be exercised in seeing that the sharpened edge of the blade is thin and evenly tapered, as an axe of this type requires much less grinding and will do the same work much more easily than one with a thicker edge. In sharpening the axe the heel and toe should be rounded to an even curve, and the edge should be thinner in these two places than in the centre of the cutting edge. An axe sharpened in this way comes out of the wood much more cleanly and will not stick like an axe whose cutting edge is straight.

The Crosscut Saw

A crosscut saw 6ft. long is best for most farm work, as it can at a pinch be used by one man working on his own. Crosscut saws vary in the type of teeth with which they are made, but the M tooth is perhaps the most popular and the easiest to keep in good order.

In sharpening an M tooth saw each of the points, two of which together make up the tooth, is sharpened from the same side. Every tooth or group of two points is then sharpened on the opposite side from its neighbour. This is clearly illustrated in Fig. 3. The V of the tooth is filed to give it a bevel of approximately 45 degrees, while the

vertical side of the tooth facing its neighbour is given only a light touch with the file at right angles to the axis of the saw blade. Too much filing of the side of the teeth is to be avoided at all costs, as it spoils the shape of the tooth and leaves it shaped as illustrated in Fig. 4. This is a distinct disadvantage, because it is the square side of the tooth which drags the sawdust from the saw cut.

In sharpening the saw for the third or fourth time the saw should be stripped—the file run on its flat side along the tips of the teeth so that all are of the same length. In carrying out this operation it is imperative that the file be kept level, otherwise the teeth on one side will be slightly longer than those on the other side, causing the cut to run to one side.

A saw is said to have "set" when the points of the teeth are bent away from the sides which are bevelled in sharpening. This causes the teeth to make a slightly wider cut than is necessary for the passage of the blade through the wood, lessening friction and considerably easing the labour of sawing.

In setting an M tooth saw each alternate group of two points is bent in the opposite direction. This can be done with a hammer and a punch by laying the saw on its side on a good solid bench and by giving each alternate group a sharp blow. The saw may then be turned over and the same thing done for the opposite side. This method of setting a saw cannot be recommended to the novice, who in the majority of cases will be well advised to have his saw attended to by someone qualified to do so. Saw sets can, however, be purchased; they work on the same principle as those used for handsaws and can be confidently recommended.

Another type of saw in common use has a W tooth. The type of tooth and the method in which it is sharpened are clearly illustrated in Fig. 5. Taking each group of three points which make up the tooth, the two outside points are sharpened and set on the side opposite to the centre point with groups alternating along the saw. With this saw, as with other types, the outside of each tooth should be filed at right angles to the saw.

The blade of a saw should always be kept clean and free from rust. A piece of pumice will do this admirably, followed by a coat of oil before putting the saw away. When cutting trees of the Pinus type a liberal cleansing with kerosene will assist in keeping the saw free from gum. If native pines such as rimu, miro, or matai are being sawn, a little milk will cause the saw to run quite freely if frothy water from a resin shake or crack is causing trouble.

Fig. 1.

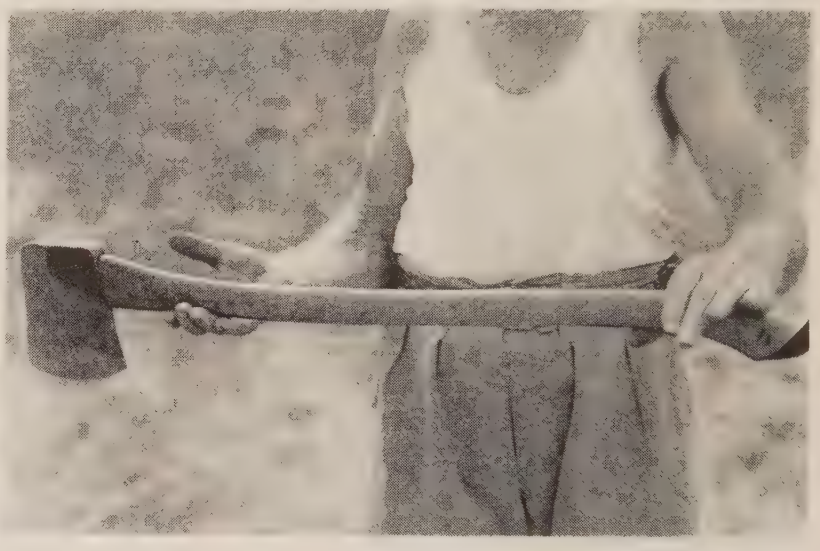
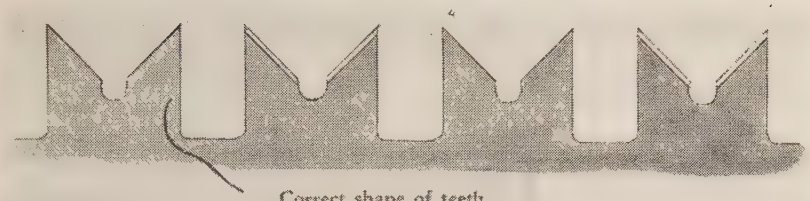


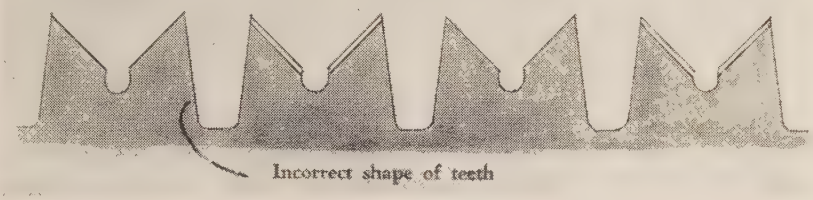
Fig. 2.

Fig. 3.



Correct shape of teeth

Fig. 4



Incorrect shape of teeth

A 10in. flat smooth file will be found best for sharpening the M tooth, while an 8in. cant-saw file will be most suitable for the W tooth type.

Maul and Wedges

A maul made from Australian hardwood is generally the best, but a good maul can be made from New Zealand timbers in the following order of preference:—Akeake, rata, or titoki. If a maul is being made on the farm, care should be taken to see that the head is not tapered too much toward the faces, as this will tend to burst the rings as they are forced on as the maul wears. A small taper is, however, necessary. In general a maul with a head 15in. long that will take 4½in. diameter rings, and with a 1⅛in. hole for the handle, will be found suitable.

In using the maul it is important to remember to change the face used for striking as frequently as possible, so that the maul will wear evenly. The handle should also be changed round to the opposite side for the same reason. A maul should not be left lying about in the sun for long periods, as this will cause the rings to loosen and come off.

Two 4lb. wedges and two 6lb. wedges should be procured. Two of these should be thin on the cutting edge for starting purposes, while the others can be used for doubling up when necessary. When using the wedges it always pays to keep a close tally on the number employed, and those not actually in use should be put somewhere out from the end of the log being worked on. This will avoid the possibility of logs being rolled on to them and the face of the axe coming into contact with them when cutting splinters or trimming posts.

The Crowbar

If a suitable bar is not already available on the farm, one can readily be made from the main drive shaft of an old car. It should be about 4ft. 6in. long and 1⅛in. to 1¼in. in diameter, with a chisel point at one end and a diamond point at the other.

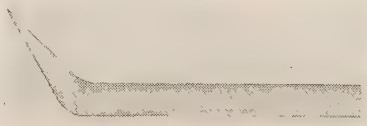


Fig. 6—Crowbar.

The chisel point should be sharp and will be found most useful in cutting splinters of wood which cannot be easily reached with the axe. If material is available for a second bar, this should be made with a bend 3in. from the chisel end. This will give better leverage than the straight one when trying to force a log apart. Care should be exercised to see that the bend is made sharp and not a gradual round bend (Fig. 6), as one of the latter type makes the bar very liable to slip.

The Log Gun

The log gun will save a lot of hard work with maul and wedges as well as saving time, particularly when holes have to be bored and charges laid and rammed. Guns are of different shapes and there is no reason for any preference for any particular type so long as it is well and soundly constructed.

The charge hole is usually ⅝in. to ¾in. in diameter bored from the sharpened end to a depth of 9in. The touch hole which carries the fuse is ¼in. in diameter and is bored nearly through to the charge hole at this width; it finally connects with the charge hole with a hole not greater than ⅜in. diameter. If a bigger hole is used, it wastes powder and results in a loss of power from the explosion when the charge is fired.

In general a dessertspoonful of powder will be adequate for a log 4ft. in length and 2ft. in diameter, and use of the implement will soon indicate the extent to which the charge should be modified for increases or decreases in length or for different types of material.

Before using the gun see that all holes are cleaned; then put in the charge and ram in a wad of paper. This will serve to keep the charge in place and also to keep it away from any moisture which might be in the timber.

The gun is entered roughly in the centre of the log, but it should be kept away from any shakes or cracks which allow the gases to escape too freely when the explosion takes place. The gun should be driven to within an inch of the touch hole and a small quantity of fine powder put into this hole before inserting the fuse. The

Correct shape of teeth

Fig. 5

Incorrect shape of teeth

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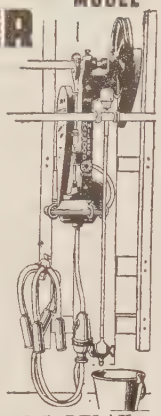

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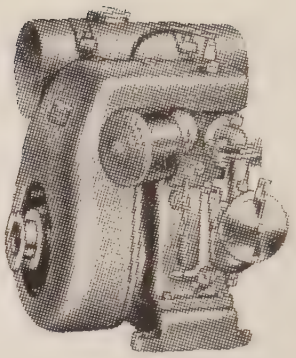

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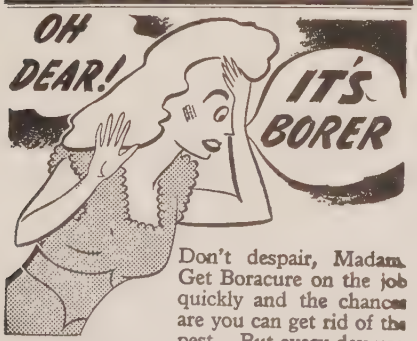

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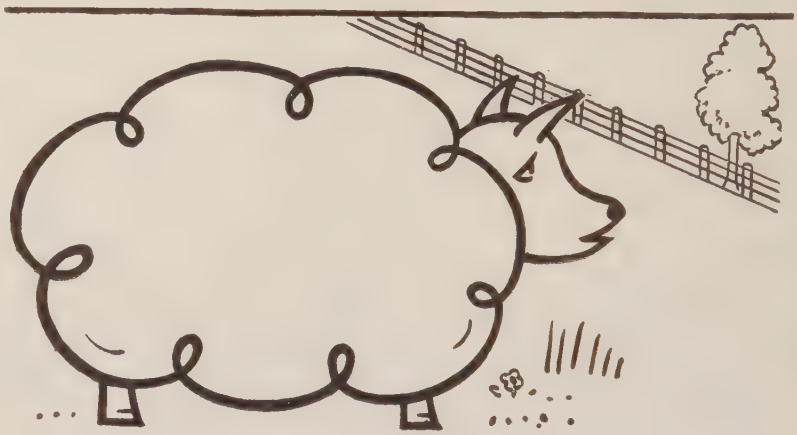

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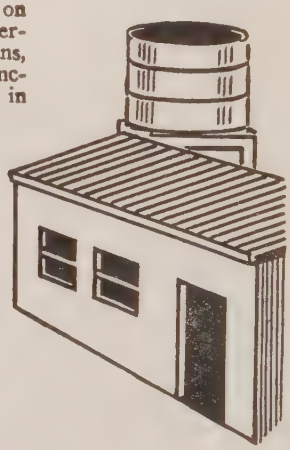

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fuse should be of the type known as safety fuse, which will burn at the rate of 1in. in 5 seconds. Thus 2 or more inches should be used, depending upon the time required to get well clear of the explosion. The end of the fuse for insertion in the touch hole should be cut square across, leaving a slanting end to be lighted. A spluttering flame is best for lighting the fuse, and the best way to obtain this is to hold the head of a match close to the core at the end of the fuse and light it with another. To avoid the gun being thrown too far clear of the log after the explosion it should be covered with an old sack before the fuse is lit.

Always stand well back from and well to one side of the log to be split. The gun is meant for low explosive only and must not be used with other material. Never use, or allow anyone else on the farm to use, such dangerous explosives as sodium chlorate and sugar.

The Cant Hook

A cant hook, used for shifting or rolling logs from one place to another, consists of a hook—roughly semicircular in shape—a link, and an 8ft. wooden lever to which the hook is attached as shown in Fig. 7. The main thing is to see that the hook is at such an angle that it will grip instantly when applied to the wood. Although the cant hook can be done without, it is a very useful implement to have when tree felling or post splitting.

Felling a Tree

If there is plenty of room to drop the tree a front scarf to a depth of 4in. to 6in. should be cut. The actual depth will be dependent upon the size of the tree and the amount of lean; a tree with a fair amount of lean requires a bigger scarf than one which is upright. The reason for putting in a scarf is to make the tree break off cleanly from the stump and also in some cases to make operations safer. Some indigenous trees such as tawa, if cut from the back only, will split longitudinally up the trunk and jump backwards without warning. Tawa has been known to split for over 30ft. of its length and the butt has landed 20ft. behind the stump.

The scarf should first be cut straight in with the saw to the required depth and then the chip taken out with the axe as illustrated (Fig. 8). A cut should then be started with the saw from the side opposite to the scarf and at the same level or only slightly above the level of the bottom of the scarf. Nothing is to be gained by making this cut too high above the bottom of the scarf, as this usually means cutting deeper before the tree breaks off. When getting towards the end of the cut both sides of the cut should be kept at as even a distance as possible from the scarf.

When it is required to fall a tree to one side or other of the direction in which the tree is leaning the wind will be found to help or hinder the work to a considerable extent. It is therefore always desirable if possible to secure the maximum advantage from the wind by attempting the job only when the wind is from the right direction. To help operations of this sort wedges can be driven into the cut as the back cut is being put in on the side opposite the direction in which it is intended the tree should fall. An alternative is to attach a wire high up in the tree and tighten it up with a wire strainer before starting the back cut. The main thing is not to attempt to pull the tree too much out of the direction of its natural lean without the proper gear to attempt such an operation. To do this successfully requires a powerful tractor with a winch to keep a constant strain on the falling tree. Under normal circumstances no attempt should be made to fall a tree at more than 45 degrees to the direction of the natural lean.

After the tree has been felled it may be measured off into the required lengths, but before crosscutting is started all limbs and rubbish should be cleared away. If a tree is being cut up on the side of a hill, an extra 2in. should be allowed in log lengths, as it is frequently most difficult to put through an absolutely square cut. If the tree has a stringy bark like some gums a narrow circle of bark should be stripped off where it is intended to put the cut through.

If a cut has to be made through a point of the log where it is "bridging"—where two points of the log are on the ground and the portion between

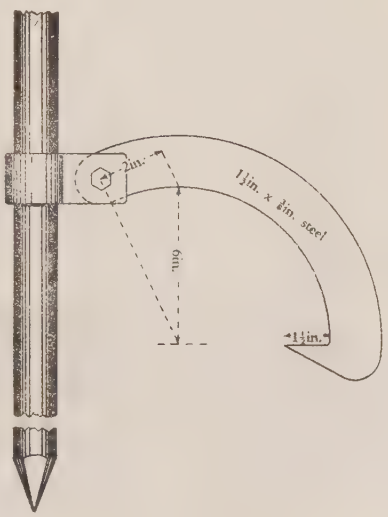

Fig. 7—Cant hook.

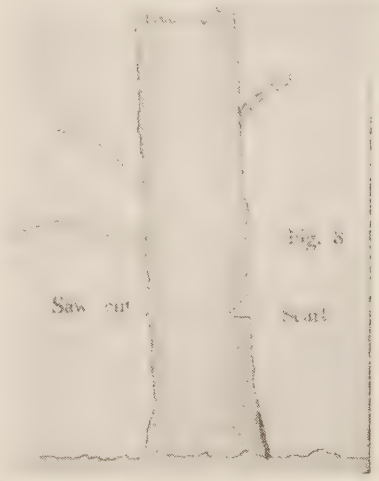

Fig. 8

is clear of the ground—a block should be put in under the log to take the weight where the cut is put through. The block, of course, should be put in at a place that will allow the saw to work freely. If this method is not applicable, the log can probably be cut through higher up the barrel, when it may be possible with the cant hook to roll the log into a more workable position.

Splitting

If other circumstances allow, it is best to start splitting as soon as logs are cut off. It is a sound general principle to begin at the end of the tree furthest from the butt. If splitting is started from the butt end there is a tendency for the split to run outwards toward the bark, particularly when splitting "off the back."

With the method of using a log gun already described a shot should split the log into three or four sections. If it is necessary to split the log still further, two methods are available. The first is known as splitting "off the back," in which the split is made in the same direction as the annual rings (Fig. 9). In the other method of splitting "off the quarter" the split is made along the line of the diameter of the log (Fig. 10).

Most trees will be found to split most cleanly off the back, and it will be noticed that when splitting off the quarter the toughest and stringiest splinters are on the outside or sap of the log. *Pinus radiata* is as a rule not suitable to split off the back unless very clear of limbs, as these grow practically into the centre of the tree.

If splitting with wedges, shakes or cracks should be used wherever possible to burst the log. If the log will not split freely, it may be turned over with the cant hook and splinters cut on the other side.

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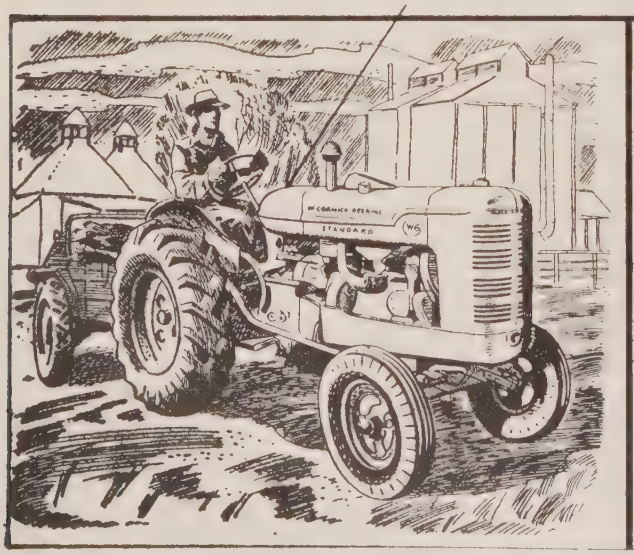

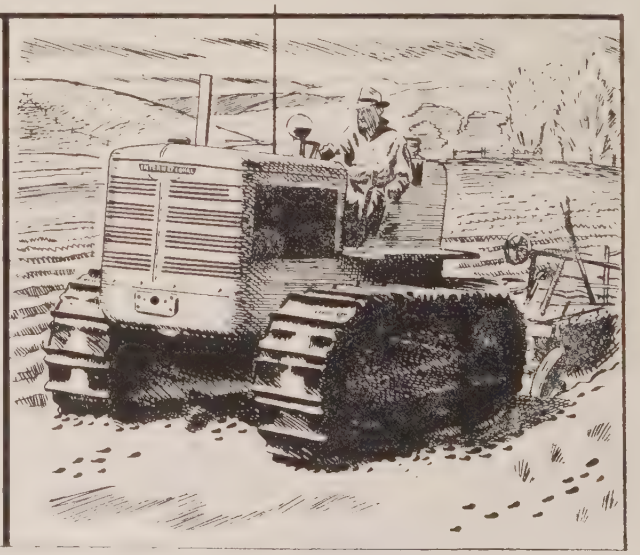

After the log has been split into quarters it can be decided whether it is better to carry on splitting off the quarter or off the back.

Splitting may be greatly assisted by the making of a number of big wooden wedges, or "gluts." They can be made any convenient size and have the advantage that if accidentally hit with the axe no damage is done.

A glut can be used to best advantage on the side of a log where the crack is well opened up; on the end of a log the glut gets torn about by the end grain of the wood.

If a sledge hammer is used in driving in wedges, the heads of the wedges become mushroomed and it is harder to enter the second wedge when doubling up, more particularly when working from the side of the log.

When splitting lengths for firewood with an axe the annual rings should be examined and a start made off the back where the rings are furthest apart, as the side where the rings are close will be found to be toughest.

Fig. 10—Splitting off the quarter.

Topping and Limb Felling

With trees of considerable height topping and limb felling should be tackled only by two men, one of whom has had experience of this type of work. While it is possible to give a few general principles, it will be found in actual practice that nearly every tree will require special treatment.

The man doing the cutting of the branches up in the tree should be a good climber and not likely to become giddy at heights.

An attempt should first of all be made to put in a small scarf in front or in the direction in which it is intended to fall the limb or top. This makes the limb break cleanly and fall clear of the tree trunk. It will be found helpful if a rope is attached far enough above the point of severance on the limb to be cut to allow the man on the ground to get leverage when pulling on the rope. This will help considerably if the branch is considered likely to fall on limbs lower down the trunk which it is hoped to save. It may also assist in making it possible for the man on the ground to guide the limb through a gap in the lower branches or to keep it clear of a fence or telephone wires.

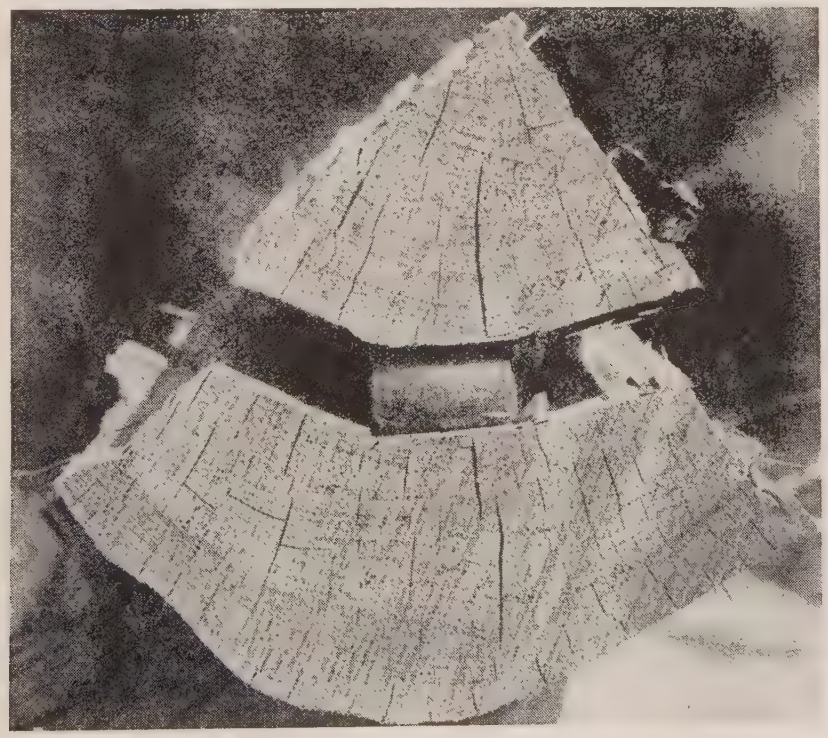

Fig. 9—Splitting off the back.

Climbing the tree with an axe is dangerous, and it is far better to try to get a line over a nearby limb and then pull the axe or saw up. If the axe is carried and placed in a fork above the climber, there is always the danger that it might be dislodged and fall on hands or arms.

An axe should never be stuck into a tree and left there, particularly if the head of the axe is buried in the wood some 7 or 8ft. from the ground. The handle may be disturbed by the shoulders of someone passing and the blade fall and inflict severe wounds. These safety precautions should never be neglected if it is desired to carry on without accidents.

If the top of a tree or a limb should fall in such a way as to catch a sapling or lower branch and bend it over without breaking it, an en-

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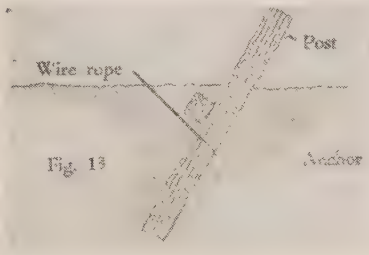
Fig. 12—The doubling up of wedges and the use of the wooden glut.

deavour should always be made to cut the supporting limb or sapling on the inside of the arc described by its bend. This will ease the tension gradually. If the limb or sapling has to be cut from the outer side of the arc, the axeman should stand as far to one side as possible.

Attaching Wires to Trees to be Felled or Topped: It is always most important that the knot tied in the wire attached to a tree to be felled or topped should not slip just as the tree is about to fall, as it is then too dangerous to climb again and fasten a further wire. The wire should be bent twice round the tree, then tied with a half hitch before twisting the end round the pulling wire. If the tree is very heavy and likely to require a very strong pull, it may be better for safety's sake to put two wires on to the tree.

If no suitable anchor such as the base of a substantial tree is available, one can be made by sinking a good strong post 4ft. into the ground with a 25 to 30 degree lean away from the tree to be pulled (Fig. 13). A good wooden block 4ft. long should then be let into the ground in front of the post at right angles to the direction of the pull with the top surface of **the block 3in. below ground level.** A narrow channel should be cut under the block so that the wire can run under the block and around the post.



Use of a sunken post as an anchor for the wire in tree felling.

If the soil is loose, a still longer block can be used; it should fit well on the wire on which the pull comes.

One end of the wire strainer is then attached to the wire round the anchor and the other end to the wire leading from the tree. The best type of wire strainer for this job is one in which the grips slide along the wire, as with the chain type it is necessary, unless the chain is very long, to tie the wire while a fresh grip is taken.

Use of Explosives

In general no attempt should be made to use explosives other than those mentioned previously in referring to the use of the log gun. Gelignite used by a thoroughly qualified person is an excellent explosive for cutting roots when stumps are being removed, but it requires very careful handling, particularly in cold weather. Serious accidents have frequently resulted from trying to warm it in kitchen ovens.

Great care should also be taken of all detonators and fuse. Containers holding any of these materials should be clearly labelled and placed well out of the reach of the prying hands of children.

On no occasion should carelessness be tolerated when explosives are being used—the results may be disastrous.

The wire and pulley block method is particularly useful when felling trees in restricted areas.

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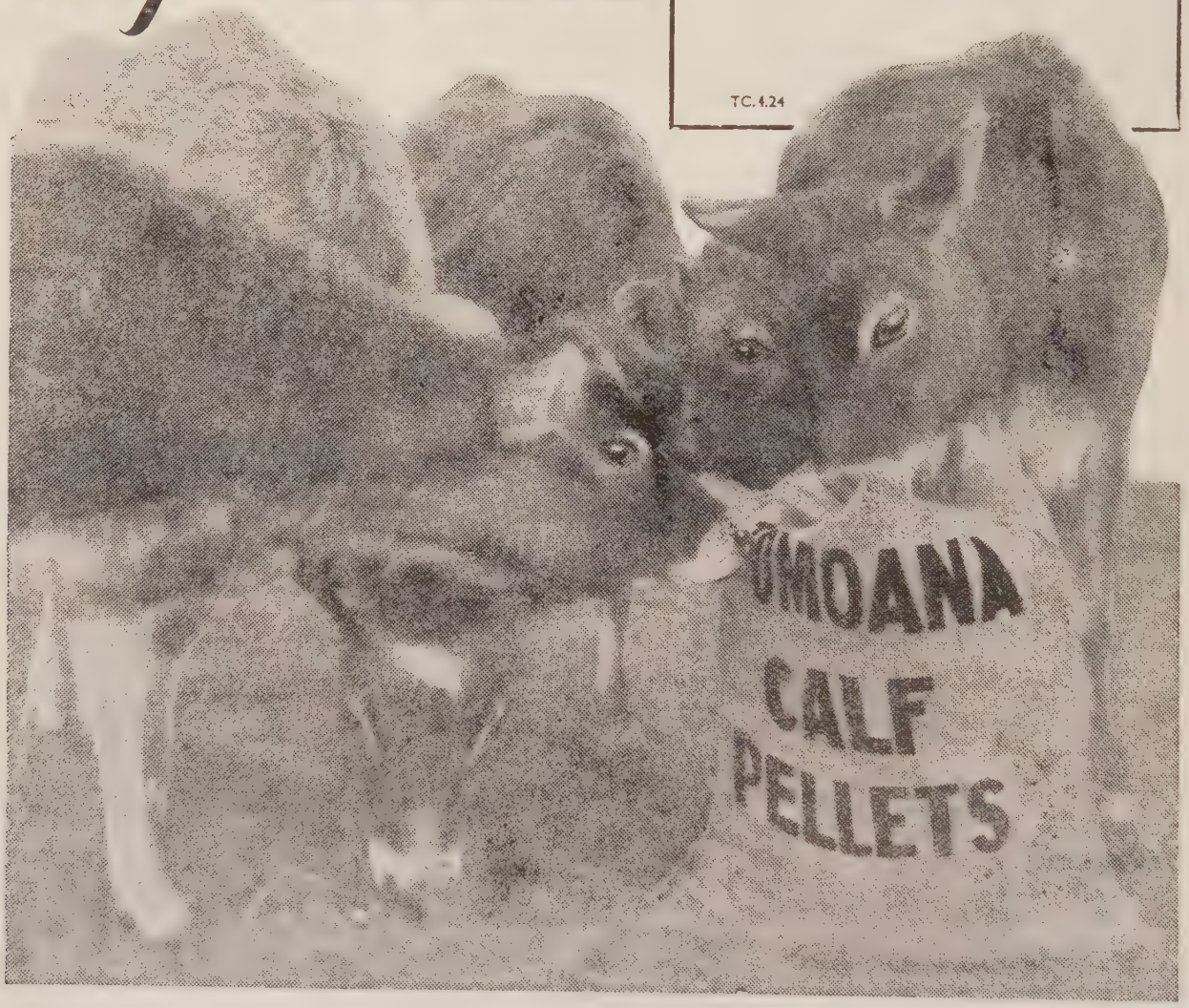


Preparing the Home Garden for the New Season

By D. K. PRITCHARD, *Instructor in Vegetable Culture, Wellington.*

SEPTEMBER is always a very busy time in the home garden. During the month preparation of the seed-bed and the sowing of most autumn-maturing crops should be carried out. On the thoroughness of this preparatory work will largely depend whether full production is obtained from the garden.

SEEDS of all members of the brassica family — cabbage (Savoy), cauliflower, and early Brussels sprouts —intended to mature during autumn should be sown during late September. Seeds for celery and celeriac should also be sown about the same time. This will apply more particularly to districts where the growing period is shorter than in many parts of the North Island.

Working Surface Soil

Where seed is sown in the open garden, it will be necessary to prepare the seed-bed thoroughly. The surface soil should be reduced to a very fine condition, levelled, and pressed down so that a degree of firmness may be obtained, as this will assist capillary attraction of moisture during the period of germination.

If shallow furrows are made 2 to 3in. apart and ¼in. deep, the seed should be sown in these sparingly, and covered with a mixture of equal parts of finely-sieved soil and sand. The same method may be adopted if the seed is sown in boxes, but these should be at least 5 to 6in. deep. Whatever method of seed sowing is adopted, the surface should never be permitted to become dry, as this will prevent good germination.

Frost-tender Plants

To obtain frost-tender plants ready for setting out when danger of frost is past, seed should be sown under glass during September. Tomatoes, cape gooseberries, cucumbers and all gourds (pumpkins, etc.) come within this category.

Boxes are most suitable for growing these plants, as they can be removed to any part of the garden during the hardening-off period. Late October or early November is generally considered a suitable time for setting out the plants in the area where they are to grow to maturity.

Tomatoes

As tomatoes are frost-tender plants attempts to produce them without adequate protection from cold and inclement weather conditions will end in failure. In the July, 1946, issue of the "Journal of Agriculture" recommendations were made for growing a small quantity of tomato seedlings.

To continue the growth of these seedlings they should be pricked out into a seedling box 2 to 3in. apart. The desirability of using sterilised soil for growing these plants is again stressed. Plants grown in this soil will have a much better chance of reaching maturity in a healthy condition than those grown in soil infested with injurious fungi or other diseases.

After the plants have been pricked out and the seedling boxes placed in a glass-covered frame, care should be exercised in applying water to the plants. While it is necessary to maintain the soil in a moist condition, excessive watering can induce damping off. This disease is common among young tomato plants, and can destroy many seedlings in a very short time. When sterilised soil is used, the chances of attack by the fungus are negligible.

Cabbage (Summer)

September is the best month for setting out summer cabbage, and the variety which has been specially recommended in "Journal" notes for several years is Golden Acre. If seedlings have not been home-grown, every effort should be made to obtain plants of the true variety. It is advisable to purchase requirements of this kind only from reliable seedsmen. When they mature, well-grown specimens of Golden Acre are a most suitable size for domestic use. The head is compact without being hard, and when the cabbage is properly cooked the flavour is outstanding.

As this variety is of medium size, plants may be set out in rows 18in. apart and at a distance of 14 to 16in. in the row. If they are grown from September onward, little cultivation will be necessary, only sufficient for weed control. When grown under favourable conditions, they will follow on after spring cabbage.

Cabbage (Spring)

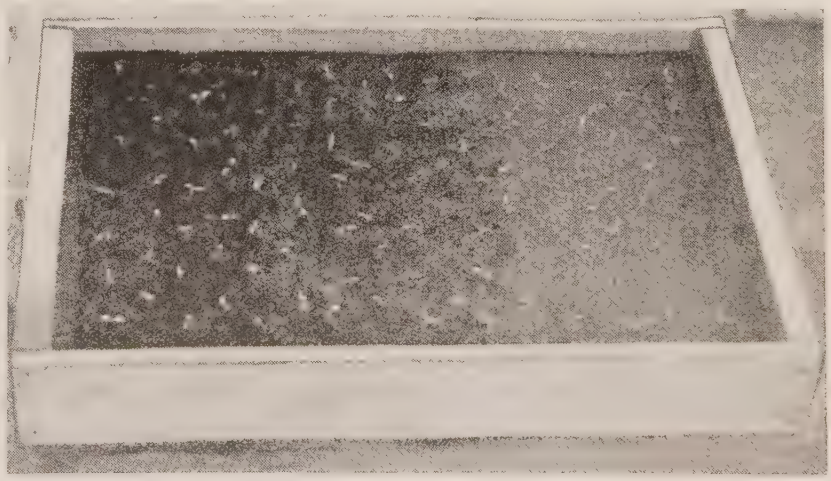
When spring cabbages are harvested the largest heads should be cut first. From September onward the heads will grow to a substantial size and later, if not used, will quickly go to seed. As soon as the heads are cut for use, the stalks should be removed from the garden.

Rhubarb

First buds of well-manured spring rhubarb roots should now be developing into stalks. It is not advisable to remove these stalks too early. Allowed to grow, they will soon make additional height and weight, and consequently become more valuable as food. Rhubarb is a gross feeder and for highest production requires heavy manuring.

Celery

Early crops of celery are often disappointing, owing to premature seeding, which invariably results from seed being sown out of season. September is generally considered early enough for a first sowing, which may be made either in a box or in a sheltered part of the garden. Seed may



Celery seedlings pricked into a seedling box.

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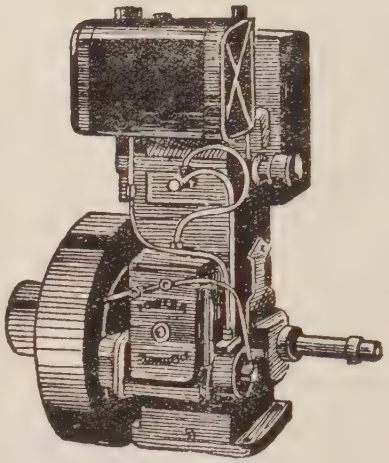

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BRANCHES THROUGHOUT NEW ZEALAND

HEAD OFFICE: P.O. BOX 99, CHRISTCHURCH.

take as long as 14 to 20 days to germinate, so that no anxiety need be felt if the young plants do not appear above the soil before the expiration of this time.

Transplanting may take place when the seedlings are 1½ to 2in. high, and they should be spaced about the same distance apart when being pricked out. Grown in this way, the seedlings should be ready for planting out during late November or early December.

Potatoes

In most districts of the North Island it may be considered safe to plant well-sprouted potato seed. In the South Island, however, the incidence of frost must always be considered before planting. Where planting has already taken place, it will be advisable to protect the top growth from blight by spraying with Bordeaux mixture. Hoeing during the early growing period will do much to encourage development of the plants and lessen the opportunities for attacks of disease.

Peas

Seed of the main crop of peas may now be sown. A tall-growing variety, such as Greenfeast, Stratagem, or Alderman, may be selected. When the soil is being prepared, it should be worked down to a relatively fine tilth. Blood and bone manure is considered a safe and satisfactory fertiliser for peas. It should be applied along the line of planting at the rate of 4oz. to every 9ft. of row, and thoroughly mixed with the soil.

The seed may be sown in a shallow trench and set at a depth of 1 to 1½in. As subsequent growth will be from 3ft. upward, it will be necessary to use stakes or brush-wood to train the plants.

As peas are invariably regarded as a desirable vegetable for household use, careful cultivation should be adopted while the crop is growing, particularly during the early stages.

Lettuce

To secure supplies of lettuce from now onward, seed should be sown in quantity to meet the usual requirements. A small amount of seed sown either in a box or in a corner of the garden will produce enough plants for ordinary household use. Good lettuce can be produced on almost any kind of soil, but heavy clay is undesirable. During September seedling lettuce transplant well and may be set 12in. apart each way.

Spinach

To follow on the crop of spinach which should now be well grown, a further sowing of seed should be made. Spinach will grow much more quickly after September than in the months immediately preceding. Seed should be sown in rows 12in. apart. Giant (prickly or winter) is recommended.

Turnips

Early White Milan and Milan Purple Top are turnip varieties which may be sown now. A fine soil tilth is desirable for sowing turnip seed, and, should germination be particularly good, the young plants may be thinned. This, however, is rarely necessary, as the roots can be used when small. Regular, small sowings are necessary to maintain a continuity of supply.

Beetroot

Turnip-rooted varieties of beetroot are generally preferred for table use. Egyptian Early Flat is a variety for September sowing. In finely-pulverised soil seed should be sown ½in. deep in rows spaced 12in. apart. If subsequent thinning of plants is necessary, those removed may be transplanted. For a main crop sowing, seed of a globe-shaped variety should be used. Darkest Globe is a variety which will prove suitable.

Radish

One of the easiest crops to grow in the garden is radish, and in most districts of the North Island it may be grown during all seasons. For best results heavy soils are not desirable.

Radish seed is usually of strong germination, after-growth being so vigorous that large sowings are not advisable. Varieties which can be recommended are Long Scarlet, French Breakfast, and Scarlet Globe.

LETTER FROM AMERICA

73-year-old Farmer Has Never Seen Fertiliser

IF the war brought no other advantages to New Zealand, at least it allowed many thousands of overseas servicemen to see that the country is civilised—which seems to have been in considerable doubt. In that the "Journal of Agriculture" also plays a part, as is evidenced in the following letter received by the editor from Lineville, Iowa, U.S.A. The letterhead reads: "G. T. Williams and Son, proprietors of 1200 acres no-mortgage farms," the last three words in capital letters and underlined.

Dear Sir:

A few years ago my son Ardon Williams was in the U.S. Army Medical Corps on Guadalcanal when he was given furlough to a rest camp in New Zealand. He was lavishly entertained by a family in Warkworth, North Auckland, whom he described as comparing favourably with our best families in U.S.A. You can imagine our surprise, for we thought New Zealand, like most of the other islands of the Pacific, was populated by heathens, and some of them cannibals.

While there he entered my name on your subscription list, and your Journal has been both interesting and instructive. However, your seasons and farming methods are almost the opposite of ours, and I thought some of your readers might like to hear a little of how we farm in the U.S.A.

Our farm is located in Iowa, about the centre of the U.S.A. Iowa is not as large as any of the other States, yet it produces more corn (maize) than any. We also excel in oats and hogs, and I think we are second in cattle. Our home is what we call modern—that is, we have water, heat, lights, insulation, refrigeration, and air-conditioning. In other words, when it gets too hot outside we just go inside and cool off. Our two sons do all the farming, and I look after our herd of registered Hereford cattle. We have only one team of horses, and we seldom use them; everything is done by machinery.

However, I am sure you could teach us plenty about maintaining the soil by raising sheep and dairy cattle. I am 73 years old and I have never seen any fertiliser, yet we raise from 50 to 100 bushels of corn an acre. But I think many of our farmers would profit by applying some of your soil-maintaining tactics, and some of our upland might be benefited by the use of fertiliser.

I want to say to all those who so kindly entertained our son Ardon that he has arrived home safely, and we want to extend our heartfelt thanks to you for your kindness.

Your friend and neighbour,
G. T. Williams and family.

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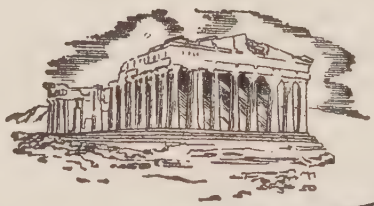

TIME MARCHES ON

. . . BUT YOUR TRUSTEE MUST BE PERMANENT

APPOINT THE PUBLIC TRUSTEE

A.1.10

Wool Marketing

THE wartime procedure for the disposal of wool will cease to apply to all wool delivered to a wool-store after June 30. Thereafter the marketing of wool will proceed in the manner usual in the wool trade before the outbreak of war in September, 1939, but subject to regulation in respect of the disposal of accumulated stocks of wool concurrently with the new clip wool in accordance with the disposals plan as set out in the Wool Disposal Act, 1945.

By regulations made under the Act on July 3 a contributory charge is imposed on all wool sold by a broker, delivered to a manufacturer, or exported on or after July 3 to meet the operating expenses of the New Zealand Wool Disposal Commission in carrying out the Disposals Plan and the expenses of the New Zealand Wool Board in carrying out its functions under the Wool Industry Act, 1944. The rate of the contributory charge is 7½ per cent. of the sale value of the wool and the person primarily liable for the charge is the person by whom or on whose behalf wool is sold by a broker, delivered to a manufacturer, or exported. In general terms the sale value of wool is the price for which it is sold or its sale value as fixed by the Commission according to whether the wool is sold by a broker at auction or delivered directly to a manufacturer in pursuance of a sale or exported without having been previously sold by a broker or delivered to a manufacturer.

Brokers and manufacturers must make periodical returns to the Wool Disposal Commission of sales in the case of brokers and deliveries to their manufacturing premises in the case of manufacturers and are required to pay to the Commission the total amount of the charge as disclosed by each return. They are entitled, however, to deduct the amount of the charge payable in respect of any lot of wool passing through their hands from moneys payable to the person primarily liable for the charge on that wool.

LUCERNE SEED

Supplies of Selected Strains Available

A **LIMITED quantity of seed of an improved strain of lucerne selected from the commonly-grown Marlborough type is available from the Department of Agriculture for distribution for sowing this season.**

This seed should be used primarily for seed production. Application for the seed should be made by growers through their usual merchant and should indicate the quantity required and the acreage it is intended to sow. Applications should be forwarded by merchants to reach the Department of Agriculture, Wellington, not later than September 16.

J. H. CLARIDGE, Agronomist.

FERTILISER RATIONING

Increase in Allocation

ALTHOUGH an increased tonnage of phosphate has been allocated to New Zealand for the next 12 months, the quantity available is still not sufficient to justify the removal of rationing regulations. It is considered that a continuation of fertiliser rationing will maintain equitable distribution and in this way ensure maximum production from the land. The importance of producing the greatest amount of foodstuffs needs no stressing at this time of world shortage.

AS the result of a conference between representatives of the Farmers' Federation, the New Zealand Meat Producers' Board, and the New Zealand Dairy Board it has been decided to adopt the following procedure for the fertiliser rationing year commencing on July 1, 1946:—

1. To increase by 20 per cent. each farmer's topdressing allocation of phosphatic fertiliser. This increases his allowance from 42 to 50.4 per cent. of the annual amount he used in the two base years ended May 31, 1941, or of any amounts granted by way of appeals before July 1, 1946.

2. To allow the same quantities of phosphatic fertilisers for the per acre dressing of crops as provided in the last rationing year, with the exception of orchard crops, which now have an allowance of 3cwt. per acre.

Maximum Quantities Available

The following is the schedule of maximum quantities of phosphatic fertilisers available for crops and other specified purposes:—

Crop, or other specified purpose.	Quantity of fertiliser per acre (expressed in terms of superphosphate). Cwt.
Carrots	2.0
Cereals—	
1. Wheat grown in South Island	1.25
2. Wheat grown in North Island	2.0
3. Maize	3.0
4. Other cereals (including barley, oats, millet, etc.)	0.75
Chou moellier	1.50
Hops	4.0
Linen flax and linseed	1.50
Mangolds	3.0
Onions	7.0
Peas, vetches, and beans	0.75
Potatoes—	
1. Planted September to December (inclusive)	3.0
2. Planted January to August (inclusive)	10.0
Pumpkins	1.50
Rape and kale	1.50
Tobacco	8.0
Turnips and rape	0.75
Turnips and swedes—	
1. When ridged	2.50
2. When sown on flat	1.50
Market gardens	10.0
Nurseries	5.0
Vineyards and orchards	3.0
Production of vegetable seeds	1.50
For sowing with grass seed or lucerne seed on cultivated land	1.50

To obtain fertilisers under the foregoing schedule it is necessary for each person to fill in a form, F.R.2 (obtainable from merchants), giving accurate acreages and the type of crops to be sown, and to sign the statement and to lodge it with the distributor from whom supplies are to be obtained.

These statements should be lodged at the earliest possible date after requirements, which must conform strictly to the acreages to be sown and the allowances for each crop, have been determined. The quantities allowed per acre have been calculated in terms of a unit quantity of superphosphate.

Equivalent Weights of Phosphatic Fertilisers

The following table gives the equivalent weights of phosphatic fertilisers (expressed in relation to superphosphate):—

Fertiliser.	Equivalent of 1 ton of superphosphate. Tons.	Cwt.
Ammoniated superphosphate in proportion of 2 parts superphosphate to 1 part sulphate of ammonia	1	10
Basic superphosphate	1	4
Potassic basic superphosphate	1	5
Potassic superphosphate	1	1
Reverted superphosphate	1	4
Serpentine superphosphate	1	7
Basic slag	1	12
Compounded slag	1	4
Heskett slag	1	12
Superphosphate and lime mixtures—		
1. 1 part superphosphate to 1 part lime	2	0
2. 2 parts superphosphate to 1 part lime	1	10
3. 1 part superphosphate to 2 parts lime	3	0

When they are placing their orders it is important that farmers stipulate whether they require topdressing or crop fertiliser.

Serpentine Superphosphate

The use of serpentine superphosphate is now optional. Last year an inadequate supply of serpentine rock and the lack of suitable equipment at some of the superphosphate works limited the manufactured tonnage of serpentine superphosphate. This resulted in a number of farmers being unable to obtain their requirements. As new sources of serpentine supply have been developed and the installation of equipment to process a high-quality product has been completed in most works, it is hoped that this year farmers' requirements will be satisfied. Under rationing farmers can obtain 27cwt. of serpentine superphosphate for each 20cwt. of superphosphate to which they are entitled.

Ways Farmers Can Assist

To facilitate the manufacture and delivery of the increased fertiliser tonnage being made available this year, farmers are asked to:—

1. **Place their orders with their distributors at the earliest possible date;**
2. **Accept delivery at the time orders can be despatched, even if this means a period of storage on the farm before use; and**
3. **Arrange for railway trucks to be unloaded as early as possible when fertiliser arrives at the railway station. A quick turnround of trucks is a most important factor in the full-scale delivery of fertiliser (and lime).**

YOUNG FARMERS' CLUBS

THE Young Farmers' Clubs movement in New Zealand is at present in a very flourishing condition. With the revival of many of the older clubs that were in recess during the war, and the establishment of a number of new clubs, it was announced at the twelfth annual general meeting of the Y.F.C. Federation in June that the pre-war total of 203 clubs had been exceeded, and today there are now over 240 clubs actively operating throughout the Dominion. It is fully expected that 300 clubs will be functioning by the end of the present season.

A special Y.F.C. supplement issued with the 'Journal" to all members of the Y.F.C. organisation now replaces the Y.F.C. section formerly published in the "Journal," and contains reports of club and district activities. Non-Y.F.C. subscribers desiring to have the supplement posted to them should apply direct to the Dominion Organising Secretary, Young Farmers' Clubs, P.O. Box 3004, Wellington.

SUBSCRIPTIONS AND CHANGES OF ADDRESS

Subscribers to the "Journal" may greatly assist the work of distribution if—

1. In giving notice of change of address the old address is also notified.

2. Names and addresses are printed in ink in block letters.

EXCHANGE SHOULD BE ADDED TO ALL CHEQUES.

If it's Iris - it's irresistible

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FOR LINGERIE LOVELINESS

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Treasured Possessions

THREE small tables ranged in a row, a polished piano top, and a folding screen of silk and lacquer—these were the temporary repository for a most interesting display of art treasures and antiques which I attended recently. Only twenty or so people were present, but each had contributed something of value to the exhibition and recounted in turn the history of her particular heirlooms.

A century-old candlestick with a cylindrical sconce athwart a curved stem like that of a wineglass—the whole an exquisite sample of the silversmith's art—stood next to a rosewood statue of a Chinese beggar whose dignity of bearing and patient mein expressed the fortitude of his race in the face of poverty and suffering. A large floral wreath made from human hair in the days when flowing tresses were considered a woman's crowning glory reposed in an ornate frame beside an ivory brooch upon which had been painted coloured replicas about the size of a threepenny-piece of India's most famous temples, including the Taj Mahal. Another brooch of Indian origin was of such fine workmanship that to appreciate fully the detail of the design the symbolical snakes and golden goddess forming the centrepiece had to be looked at through a magnifying glass. Other unusual miniatures comprised a mother-of-pearl fishing junk barely an inch long; a Lilliputian elephant; a rabbit carved from jade; and a Japanese teaset with cups less than fingernail size, and teapot and caddy in proportion, the latter possessing infinitesimal lids.

There were all manner of links with the British Isles. Among the items having a direct association with the mother country were a George II shilling; a long-handled punch ladle reminiscent of Dickensian revels; a pair of elegant china dolls, playthings of some Victorian child; a blue Coalport cup and saucer that had belonged to Ruskin; and the sun-dial from a Bideford home which had connections with the Carey family who featured in Charles Kingsley's immortal "Westward Ho!"

"The Girl and the Goat," a piece of early Staffordshire, evoked memories of the green hills and valleys of Wales and a little old lady who 80 years ago lived in a picture-book cottage with a stone-flagged floor and a windowsill gay with geraniums. She gave the statuette, then very old, to a young girl who visited her, and it had subsequently been handed down from one generation to another ever since.

Ireland's loveliest laces made a bridal gown of the year 1809 a dream of beauty. Fashioned of satin the delicate colour of a tea-rose, the gown had a low, rounded neckline, tiny puffed sleeves, and the smallest waistline I have ever seen (the fetish for slenderness had its devotees even in those days!). There were satin slippers to match, a shoulder scarf of Carrickmacross lace, and, most beautiful of all, a Limerick lace veil that fell in soft, gossamer folds. Scotland, too, provided a romantic note—a shoe of gold brocade which had once graced the slim foot of the fair, ill-fated Mary Queen of Scots.

Samples of handiwork were numerous, ranging from intricate patterns of Honiton and petit-point lace to cross-stitch and darning so perfect that it resembled part of the pattern of the material. An exhibit which aroused much admiration was a Kashmiri shawl of black net embroidered in rose and gold and royal blue flowers and leaves that glowed like the green fire of emeralds. Those of you who do your own spinning and dyeing would have been interested in the rainbow-striped cushion cover hand-woven by an Indian woman.

Indeed, there was quite an array of treasures from Eastern lands: Burmese incense burners in the guise of legendary lions; a cedarwood casket carved by a native of Madras; a jar of Venetian glass as dazzingly blue as the sea on a bright summer's day; a New Testament with a mother-of-pearl cover, souvenir of Jerusalem (beside it lay a grey-green spray of olive leaves plucked in the Garden of Gethsemane); salt-spoons of silver in the graceful bamboo pattern with a Chinese character inscribed on the handle; a mother-of-pearl spoon from Rabaul; a minute gilt figure of the guardian deity of a shrine in the ancient willow capital of Kamakura; a Satsuma sugar-bowl and teapot whereon tiny jewel-coloured butterflies hovered so realistically that they looked as if they would flutter out of reach if you approached too closely.

Lists of garments required by a lady of fashion as a prospective resident in the Antipodes during the eighteen-fifties were set forth in a quaintly-printed handbook of that period. In addition to the prodigious number of gowns and wraps deemed necessary, milady's trousseau was woefully incomplete without three or four dozen petticoats, nightcaps, and pairs of stockings! Another link with the colonies was a sovereign which had been part of a gold shipment aboard the s.s. Katipo when she foundered on the Seal Rocks off the Newcastle coast in August, 1895, and all lives were lost. The gold remained buried under thirty fathoms of water for a whole year until salvaging operations could be carried out successfully. Several of the sovereigns thus recovered were mounted as brooches. Needless to say, the owner of the one on view hailed from the land of the bluegum.

What a lot of pleasure is to be derived from an exhibition of this kind. Not only is our joy in our treasured possessions heightened by sharing them with others in this way, but history becomes dramatically and vividly alive, instead of being a drab procession of dates and names. We are spiritually refreshed by having looked upon beautiful things, and we gain a new knowledge and understanding of the people of other countries through the creative skill of their craftsmen.

Many

Lentil loaf with parsley sauce

By—
EVA TOPPING,
Rural Sociologist, Auckland.

ATTRACTIVE MEALS

VEGETABLES are often looked upon merely as the accompaniment of meat, but if you want to save coupons for the "Food for Britain" campaign; if your menfolk are not killing for a day or two, or if there is some other reason for having a meatless or almost meatless day, there are many ways in which vegetables can become the main dish and provide a healthful and very appetising meal.

CHEESE, dried peas or beans, milk, and eggs can substitute for meat in providing proteins. Here are recipes from which to choose; some contain a little meat or bacon, while others are completely vegetable dishes.

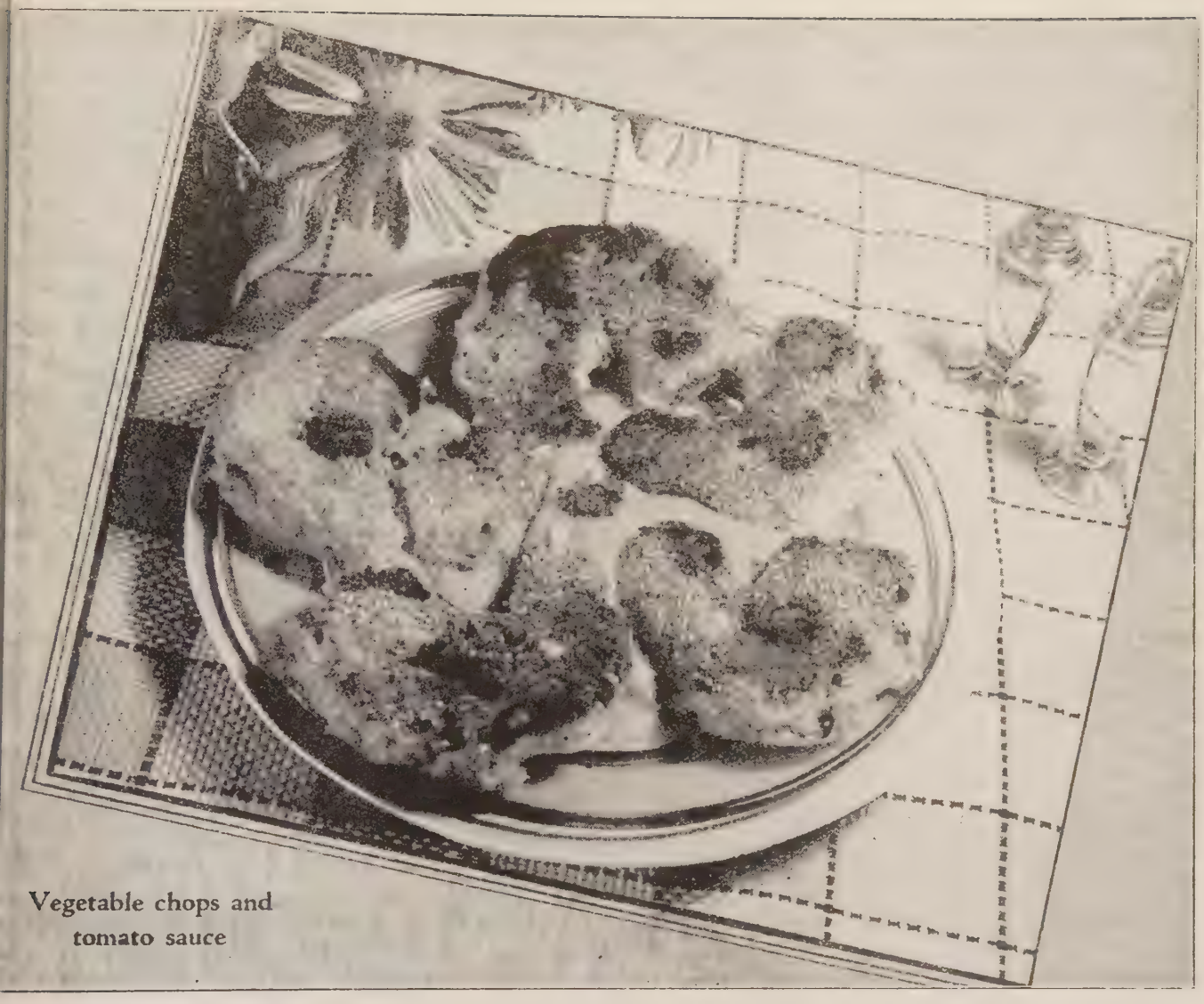
POTATO STEW

Fat for frying, 4 rashers bacon, 1 medium onion, 2 level tablespoons flour, 2 tablespoons vinegar or 1 tablespoon lemon juice, 1 pint stock, 2lb. potatoes, sprig of thyme, 3 leaves sage, salt and pepper, parsley.

Peel potatoes and onion, and chop onion and cut potatoes into small pieces. Cut bacon into small squares. Melt the fat and fry bacon and onions until golden brown. Add flour gradually, stirring continually. Add stock and stir until boiling. Add potatoes, herbs, salt and pepper, then cook gently until potatoes are soft, keeping closely covered. Sprinkle with chopped parsley before serving. Small pieces of flap mutton can be used instead of bacon.

LEEK AND BACON CASSEROLE

4oz. bacon, 3 leeks (medium sized), 2 potatoes, parsley, salt and pepper.



Vegetable chops and tomato sauce

WITHOUT MEAT

Cut bacon into small pieces and fry lightly with chopped leeks. Grease the casserole and arrange layers of sliced potatoes. Cover each layer with some of the bacon and leek mixture and sprinkle with parsley. Make the last layer potato. Half fill the casserole with stock, water, or milk and water. Put on lid and cook for one hour, removing the lid for the last 10 minutes to brown the top layer of potatoes.

PEA CHOWDER

1 breakfast cup of mixed, diced vegetables (potatoes, carrot, turnip, and celery), 1 or 2 rashers bacon (chopped), dripping for frying, ½ cup dried peas (previously cooked), 1 level tablespoon flour, ½ pint hot milk, parsley.

Fry bacon, add vegetables, and fry until browned. Add only enough boiling water to cover, and cook until vegetables are almost ready. Add the peas. Mix flour with a little cold water and stir into the vegetables, boil for a few minutes and add hot milk. Sprinkle with chopped parsley and serve with triangles of toast or fried sippets.

LEEK PIE

Crust: 6oz. flour, 2oz. fat, 1oz. grated cheese, 1 teaspoon mustard, a little cayenne pepper, water to mix, salt.

Filling: 5 leeks, 1 level tablespoon butter or clarified dripping, 1 level tablespoon flour, about ½ pint leek liquor and milk, 1oz. cheese.

Rub fat into flour, add other ingredients, and mix to firm dough with water. Roll out and line a pie plate or sandwich tin. Prick the bottom of dough with fork, weigh down with dry bread crusts (these can be used later to make breadcrumbs for frying) and bake until firm, but not browned. Meanwhile cut 4 leeks into 1in. lengths or in rings, and partly cook in very little water or stock. Make the cheese filling, drain leeks and spread over the prepared pastry shell. Add the filling and sprinkle with the remaining leek, chopped fine and fried in a little fat,

and some grated cheese. Decorate with pastry strips and bake for a further 10 minutes until brown. If time is short, cook all the leeks and sprinkle the top of the pie with grated cheese only.

ONION AND CHEESE PIE

2 large onions, 6oz. cheese, 1 teaspoon butter or dripping, 1 breakfast cup breadcrumbs, 4 medium potatoes. 1 cup milk.

Mince, grate, or chop the onions very small. Add grated cheese, breadcrumbs, and moisten with some of the milk. Grease pie dish or casserole. Slice potatoes (cut very thin or they will not cook in time) and make alternate layers of potato and cheese mixture, finishing with potatoes. Add the rest of the milk and dot with butter or dripping. Put on lid of casserole or cover pie dish with greaseproof paper pleated on the rim. Bake for 1 hour, removing cover during the last 10 minutes to brown the top.

VEGETABLE PIE

Filling: Cooked, mixed vegetables to fill pie-dish (carrots, swede, turnips, cauliflower, parsnips, onion, etc.), 2 tablespoons chopped parsley, 1 dessertspoon grated onion, ½ pint liquid (stock, water, milk, or a mixture).

Crust: 2 tablespoons oatmeal, 4 tablespoons mashed potato, 4 (rounded) tablespoons flour, 1oz. fat, 4 level teaspoons baking powder, 2oz. grated cheese, water to mix, salt.

Cream fat and potato and stir in cheese, oatmeal, flour, and salt with sufficient water to form a stiff dough. Place vegetables in pie dish, sprinkle plentifully with chopped parsley, add liquid (left-over gravy gives flavour) and seasoning. Roll out pastry and cover pie. Bake in a moderate oven for about half an hour until pastry is cooked and lightly browned.

Onion and cheese pie.

VEGETABLES AU GRATIN

3 large cups diced, cooked vegetables, 1 large cup cooked, dried beans or peas, 1 small chopped leek or onion, 3oz. grated cheese.

Prepare vegetables and cook in one pot. Mix 4 tablespoons flour with a little cold milk. Boil ½ pint milk and pour over the flour mixture, stirring well. Add about ½ pint vegetable water and return to saucepan and cook for five minutes, stirring all the time. Add the partly-cooked vegetables and half the cheese. Pour into a fireproof dish and sprinkle with remainder of the cheese. Brown in the oven or under grill.

VEGETABLE CURRY

1 cup brussels sprouts, 1 cup cauliflower sprigs, 1 cup small onions or shallots, 2 tablespoons dripping, 1 tablespoon curry powder, 1 tablespoon flour, salt, 1 cup milk, lemon juice, if desired.

Half cook the vegetables in a small amount of water; strain, saving the liquid. Put vegetables into frying pan with dripping and brown a little. Sprinkle with curry powder and flour, add 1 cup of vegetable water and the milk, cover and simmer until vegetables are tender. Add fried bacon or sliced hard-boiled eggs to curry a few minutes before serving.

VEGETABLE CHOPS

2 cups mixed vegetables, mashed, 1 cup mashed potatoes, 1 teaspoon onion juice, 1 tablespoon chopped parsley, pinch of thyme or mixed herbs, salt, pepper, 1 egg, fat for frying, dried breadcrumbs.

Mix vegetables and potatoes and mash well. Add salt, pepper, herbs and parsley and enough beaten egg to bind. Turn on to a well-floured board and shape into cutlets. Dip in the remainder of beaten egg (mixed with milk if necessary). Coat with dried crumbs or oatmeal. Fry in deep fat until brown. Place a piece of maca-

Leek pie.

Vegetable curry served with bacon.

roni in the narrow end to represent bone. Serve with cheese sauce, or tomato sauce made as follows:—

2 level tablespoons butter or dripping, 2 level tablespoons flour, 1 cup tomato puree, salt, pepper.

Melt fat, stir in flour, blending smoothly. Add tomato puree and boil until cooked, stirring continually. Thin with vegetable water, if too thick.

SAVOURY PUDDING

¼lb. macaroni, 2oz. oatmeal, 3oz. dried peas, 1 cup bottled tomato pulp or 2 or 3 fresh tomatoes, 2oz. grated cheese, 1oz. dripping, pepper and salt.

Soak the peas overnight, and boil with macaroni until quite tender. Make a sauce with dripping, oatmeal, and 1 pint vegetable water or milk and water. Put in tomatoes. Add cheese, peas, and macaroni and seasonings. Pour into a greased pie dish, grate a little cheese on top, sprinkle with dried breadcrumbs, and brown in the oven or under grill.

BEAN AND NUT LOAF

2 cups cold, cooked beans (haricot or lima), 1½ tablespoons tomato relish or sauce, 1 tablespoon onion (chopped fine), 1 egg, 1 cup breadcrumbs, ½ cup finely-chopped walnuts, or peanuts which have been roasted and minced.

Mix beans, nuts, and crumbs with salt and pepper. Stir in the relish, onion, and egg. Shape into a loaf and bake 25 minutes in a buttered tin or pie dish. Turn out and serve with tomato, cheese, parsley, or onion sauce.

LENTIL OR SPLIT-PEA LOAF

1 cup diced carrot, 1 cup diced parsnip, 1 cup diced potato, 1 cup lentils or dried peas (previously soaked and partly cooked), 4 tablespoons finely-chopped onion or leek, 2 tablespoons minced celery, 1 cup stale breadcrumbs, 3 tablespoons dripping, ¼ to ½ pint stock or milk, 1 egg, salt and pepper.

Prepare carrot, parsnip, and potato. Cut into dice and partly cook in small amount of salted water. Drain, saving the liquid to moisten loaf. Mix all the drained vegetables together in a basin and add breadcrumbs and melted dripping. Stir in beaten egg, salt and pepper, and enough vegetable water or milk to moisten thoroughly. Pack into a well-greased loaf tin or pie dish, cover with paper and bake for 1 hour, removing paper for the last 10 minutes. Turn out on hot dish and cover with parsley sauce.

[Photographs by Sparrow Industrial Pictures, Ltd.

A GOOD WOMAN

She doeth little kindnesses
Which others leave undone or despise,
But naught which makes our hearts at ease,
Or bringeth happiness or peace,
Is low esteemed in her eyes.
Blessing she is; God made her so—
And deeds of week-day holiness
Fall from her, noiseless as the snow,
Nor hath she ever learnt to know
That aught were easier than to bless.

—Sent in by "E.W.," Waiheke.

The New Flour

THE new flour is milled to make the world's wheat crop go further. It is creamy-white or beige—darker than the white flour with which we are familiar. This colour is due to the presence of more whole wheat kernel than is usually extracted when the ordinary white flour is made. Plain scones, biscuits, pastry, puddings, and cakes will be slightly darker in appearance than formerly, but no change in colour will be noticed if the recipes use eggs, spices, cocoa, or other ingredients which colour the mixture. In cake making the flavour will be much the same, but the texture will not be quite so delicate and smooth, nor will the cake be quite so large as when made with white flour. For bread the usual recipes can be followed, but the dough should not be allowed to rise after it has doubled its original size. The loaf will not be quite so large and it will not be quite so nicely rounded. For all other purposes—gravy, sauces, soup, thickenings—the new flour can be used in exactly the same way, and in the same amounts as customary when using the ordinary white flour.

Eva Topping, Rural Sociologist, Auckland.

Discolouring of Preserved Fruit

"COULD you tell me why preserved fruit, particularly pears, darkens at the top of the jar and gradually extends to the bottom; also if such fruit is harmful to eat," writes M.A.B., Foxton.

The following reply has been supplied by the Rural Development Division:—

The darkening is due to the activity of enzymes, the same type of organisms which cause darkening of raw peeled fruit. These enzymes are active in the presence of air, and are usually completely destroyed in preserving because of the heat used and the fact that the air is driven from the bottles during processing. They may continue to act and produce darkening, however, if the food is not completely covered with liquid and there is air left in the bottle, or if heat penetration during processing is slow. Fruit below the top of the jar which is not badly discoloured is safe to eat, provided there are no other signs of spoilage, such as an unpleasant odour.

That if life be a burden, I will join
To make it but a burden of a song.
This to me is life,

—Bailey's "Festus."

Gardening in September

HARDY annuals and sweet peas may now be sown in all districts, provided the soil is in suitable condition. In late districts there is still time to sow half-hardy annuals in boxes under glass for bedding out later when all risk of severe frost is past. In very early, frost-free districts half-hardy annuals may now be planted out, but in most places it is still too early to do so. If nemesias and other annuals show flower while they are still in their boxes, it will be advisable to nip these flowers off when planting.

Kentias, asparagus fern, and other evergreen house plants should be repotted to keep them growing freely. Turn the plant carefully out of its pot, remove the piece of broken pot from the bottom of the ball of soil, very gently tease away some of the old soil without injuring the roots, and repot firmly into a new pot, preferably of a size larger than the previous one. A good soil mixture consists of 7 parts loamy garden soil, 3 parts peat, pure leaf-mould, or well-rotted compost, and 2 parts coarse gritty sand. To this is added ½lb. complete fertiliser and ¾oz. agricultural lime for each bushel of soil mixture (this is the well-known "John Innes" potting compost). Newly-potted plants should be watered sparingly for the first few weeks.

Geranium plants growing in pots should now be shaken out, and repotted in the manner described for kentias. At the same time the top of the plants should be cut back hard, to keep them shapely and encourage new growth. The ends of the prunings can be made into cuttings which will strike readily in a cold frame.

Gerberas which are flowering well are best left undisturbed; but after a few years, when plants lose their vigour, they can be lifted at this time of year, divided, and replanted. They succeed best in a sunny position in soil containing plenty of humus, but the site must be well drained and not liable to waterlogging in wet spells.

When bulbs grown in pots have finished flowering, they should not be thrown away, but planted back into the garden. They will recuperate and flower again in a year or two.

Rhododendrons and azaleas have shallow, fibrous roots which suffer if the soil dries out, especially if the sun beats on the soil beneath the bushes. A thick layer of compost, leaves or lawn mowings should be spread on the soil around and under isolated bushes.

Corms of tuberous begonias should be planted at once in shallow boxes of flaky leaf-mould. The corms should be only half buried in the leaf-mould, with the buds uppermost and above the surface. Put the boxes in a glasshouse or warm window and keep the leaf-mould slightly moist, but not sodden. The plants are ready for potting up when young shoots and roots appear or, if new plants are needed, some of the shoots can be cut off carefully when they are about 4in. long to make cuttings.

When bush roses have been pruned, the prunings should be collected and burned, and the ground around the plants lightly forked over. A generous topdressing of animal manure, compost, or leaf-mould should then be spread over the surface to prevent the soil from drying out and cracking later in the season. This is most important when roses are being grown on light sandy soils.

Catmint (*Nepeta mussini*) should be trimmed hard with the shears to keep the plants neat and encourage new growth. New plants can be raised by making cuttings from the ends of some of the trimmings and rooting them in a cold frame.

If a new bed of violets is required, it should be planted up as soon as rooted runners can be detached from the old plants. Violets succeed best in a shady, moist situation in soil containing plenty of humus.

New lawns or bare patches in old lawns may now be sown, provided the soil can first be worked down into a fine tilth. A mixture of 2 parts chewings fescue and 1 part browntop, sown at the rate of 1oz. per square yard, will produce a fine close turf.

Further gladiolus corms should be planted to ensure a long succession of bloom through the summer months. A few corms should be left for later planting.

If plants are seen to have been cut off a fraction of an inch above the ground, it is almost certain that a cutworm is responsible. This pest can be very destructive in the flower garden, and a close watch should be kept from now on for signs of its attack. It can best be controlled by using the Paris green bait (see page 50 of "Vegetable Growing in the Home Garden," price 6d., from any office of the Department of Agriculture).

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GARDEN GOSSIP

I WAS most interested in the article on geranium growing. Some time I hope to be able to grow all kinds. I remember when we holidayed at Stewart Island how amazed we were at the way geraniums grew there, especially the pink, ivy-leafed one. The wealth of bloom round one particular cottage has remained in my memory, a glimpse of beauty to be cherished always. At present I am trying to nurse some very small slips through the winter, but I am not feeling too optimistic about the results.

Making pot-pourri must be a fascinating pastime and when my garden grows I hope to try it, too. I'll be remembering the biscuit trick!—**"Cloudy," Ashburton.**

A SEASON of frosts and brilliant blue skies is now ours to enjoy. Perhaps we shiver when we jump out of bed and gaze upon a white landscape, but winter has a beauty of its own. I have a few brave jonquils in bloom already, and some pink violets! The drought this year has caused strange happenings in most gardens, and many plants which had not reached their normal maturity were well on the way to flowering when the frosts arrived and straightway collapsed.—**"Native Flower," Waipukurau.**

"HALF a proper gardener's work is done upon his knees." So many "Good Neighbours" are keen gardeners and know from experience that the "glory of the garden" lies in hard work and prayer and that a garden holds something for us all, old and young, weak and strong.—**"Willwin," Matamata.**

I DO enjoy reading about other people's gardens, and I can sympathise with those whose gardens have suffered from the drought. At this end of New Zealand we seem to have had the opposite kind of weather, and I am afraid lots of the chrysanthemums will not get a chance to flower. Like "Vista," though, our faith never dies, and we look forward to the next season.—**"Faith," Southland.**

FURNISHING THE HOME

By NORMA K. METSON, *Rural Sociologist, Wellington.*

FURNISHING a home is a most important family undertaking. It means spending a lot of money, it demands planning and co-operation, it gives opportunities for originality, and the influence of some of the choices made will be lifelong.

HOME furnishing problems may seem to be entirely individual because no two families are the same in their needs and tastes. Mrs. A. has an old-fashioned homestead of two stories and 12 rooms; Mrs. B. an almost too compact modern bungalow; Mrs. C. has an only daughter; Mrs. D. has five boys, and so on. But no matter how varied the circumstances, there are general principles which can help to achieve satisfactory results. Some people have a natural flair and can create lovely effects without knowing quite why or how. Others less fortunate find it easier if they have some kind of guidance.

This series of articles makes no attempt to write prescriptions for particular rooms. Its main purposes are to suggest methods which will make it easier to plan for and choose satisfactory furnishings and to present ideas which can be adapted for use in many different situations. New Zealand homes are the centre of family life, which is informal and friendly. In most of these homes are children who do not leave until they are adults, and even then return at intervals. The farm home in addition is an important part of the "business," and demands on both working and living space are increased. Choosing furnishings which will meet the varied needs of a growing family, working, playing, sleeping, and eating within the restricted area of the typical five-roomed house, is obviously no easy task.

Appearance and Comfort

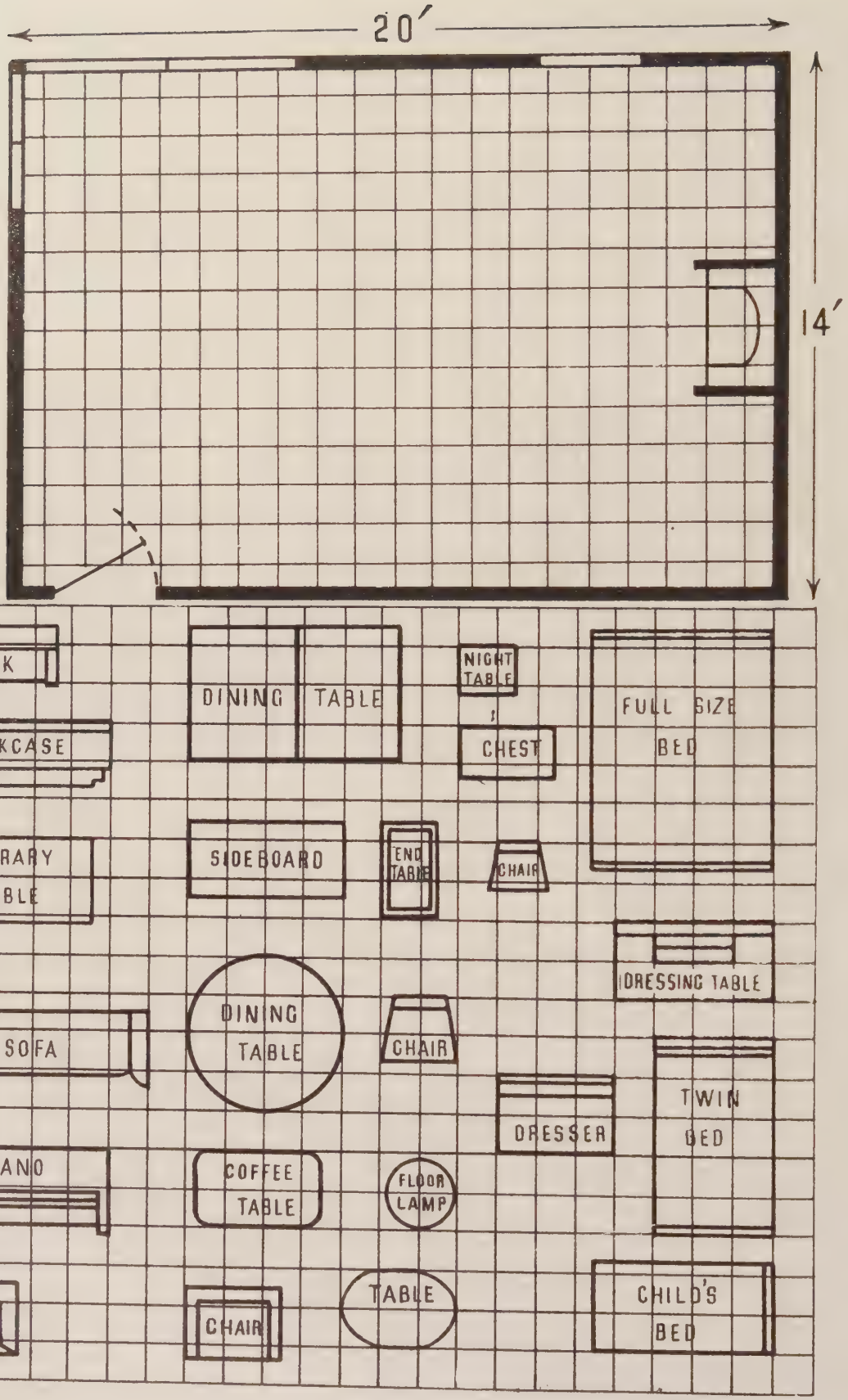
The things to aim at in furnishing are a pleasing appearance and arrangements that are comfortable to live in. Fortunately the things that work best usually look best also, but unfortunately it is not easy to find exactly the right kinds of furniture. The best rooms are those which are restful without being dull, and where colours are harmonious but not hackneyed. The cost and effort of upkeep should not be excessive, and furnishings should be planned so that additions or replacements can be made without upsetting the whole scheme. All modern tendencies—the high cost of furnishings, small rooms, built-in fittings, the need to reduce housework, and the general trends of taste—make simplicity essential.

The secret of successful furnishing is to view the problem as a whole. For those starting off to furnish a home for the first time this means considering

1. The kind of home that is needed, and what the rooms will be used for;

Photograph in heading by Sparrow Industrial Pictures, Ltd.

Plans of rooms and cut-outs of furniture, drawn to scale, are helpful in deciding what is needed for each room and how it can best be arranged.



2. How much money can be spent immediately, and the approximate amounts which can be spent for some time in the future; and
3. Any other resources available—furniture already owned, or skill in carpentry.

The scheme should be complete from the beginning, though everything cannot be bought or made immediately. Only the minimum essentials should be bought at first and other items added when convenient, as living in the house will usually cause some changes in the original pencil-and-paper plans.

But planning as a whole does mean that the house will be unified and not a collection of unrelated rooms, and also that pieces of furniture will not be bought haphazardly because of their individual appeal or cheapness, without consideration of whether they will fit in. In the same way, if redecorating is to be done it is wise to take careful stock of the present position, and see which articles will fit as they are into the new scheme, which ones need reconditioning, and how much should be discarded or replaced; and again to plan the changed room or rooms as a whole.

Planning is Important

Planning in this way may seem too much bother, but it is most important and will save time, money, and disappointment. Here are some ways it can be made easier:

1. Try to find some definite starting point for your ideas. It may be something concrete—a piano, or the colouring of a favourite picture you want to hang in the living room—or it may be merely a memory or a vision of an ideal room. Without some such anchor you are likely to be overwhelmed by possible alternatives.
2. Another good way is to look at the empty room, then shut your eyes and try to picture the finished room. You may be lucky and get a complete image, or you may merely capture one or two points—the colour of the window curtains, or the position of one or two big pieces of furniture, but again this gives a starting point.
3. Make a collection of illustrations, pieces of material, ideas for colour schemes and decorative details. Many books and magazines on the subject are available at the libraries, and though the pictured rooms in ideal homes are seldom suitable for complete reproduction they provide valuable ideas.
4. Use cut-outs and plans of the rooms drawn to scale. Sketches are given of pieces of furniture which can be traced, cut out, and fitted into the room plans. A scale of ¼in. to 1ft. is suitable. In this way you can see what pieces and arrangements of furniture fit best into the rooms.

Horizontal lines predominate in most modern rooms.

Consistency of Style

The general style of furnishings is another question which has to be decided. House furnishings, as well as clothes, can be "tailored" or "fluffy"; they may combine to make a pleasing ensemble, or they may never get away from the appearance of a haphazard collection of unrelated parts. Good style is achieved by working with a central idea and making all the details conform, avoiding such combinations as cabbage-rosy wallpaper, chromium-framed chairs, and tables with heavy bulbous legs.

Few people attempt to recreate complete "period" rooms (which is one way of securing a consistent style), but almost everyone has been made aware of the problem by seeing the urgent necessity for altering an ancient sideboard or chest of drawers so that it will not look hopelessly out of place among newer things. Much present-day furniture is made in complete or partial imitation of older styles, so it would be quite possible to choose a houseful of new pieces and yet have no consistency of style nor anything truly modern in design.

It is important, too, that furniture should be neither too big nor too small for the room, and that individual pieces should be in scale with each other. A whole room may be made to look wrong by a spindly little table which, placed next to a large upholstered couch, gives an absurd "dignity and impudence" kind of effect.

Basic Elements

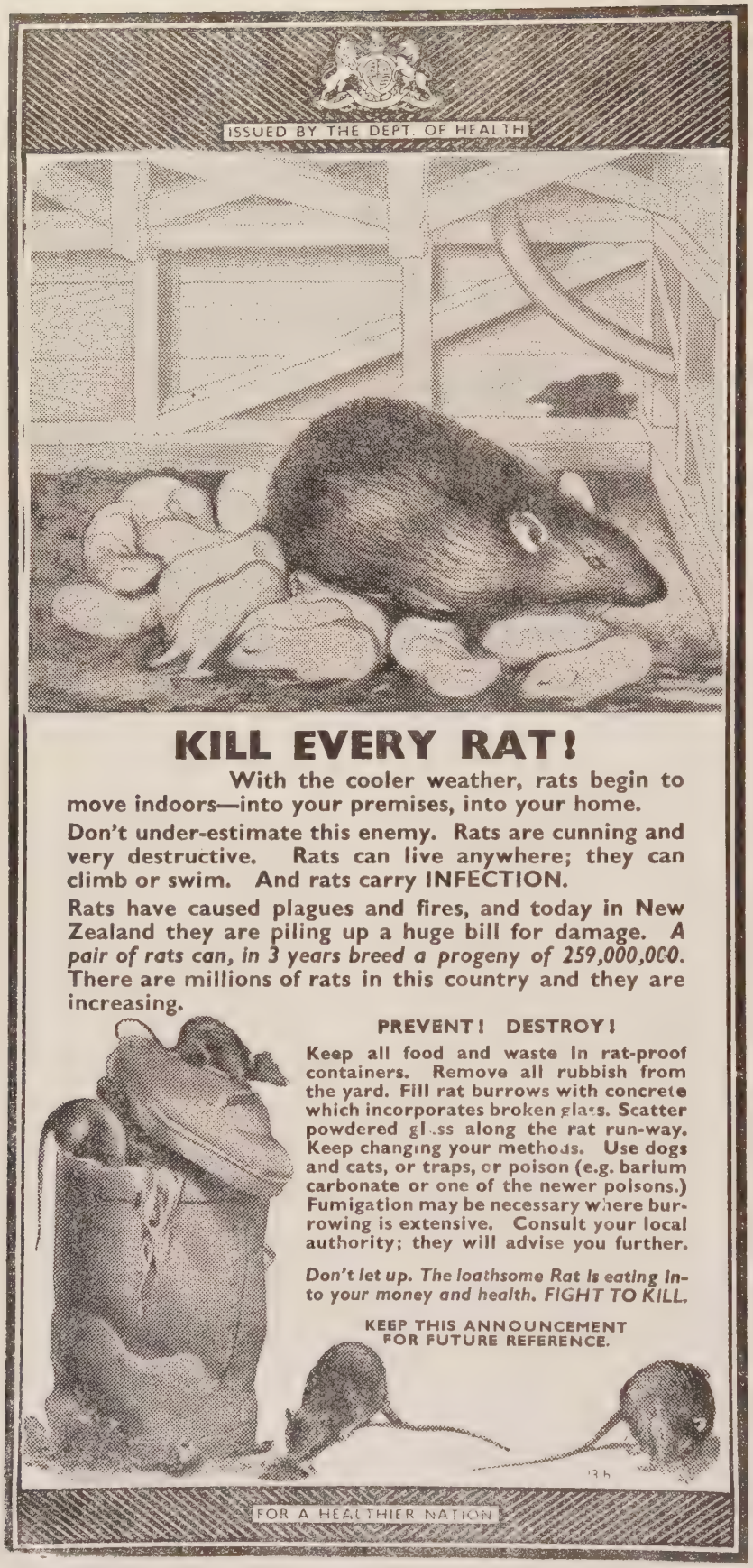
In interior decorating, it is a great help to stop thinking in terms of beds, sideboards, ornaments, carpets, and other made-up individual items, and to consider instead the basic elements out of which the finished effect must be built. What is it, then, that we have to work with? What comes out of taking a room and its furnishing apart? The answer is line, form, pattern, texture, light, and colour.

Line and Form

Most rooms are originally rectangular, with straight lines predominating, but curves are often introduced structurally in windows or fireplace, and frequently in furniture. Smooth flowing lines in a room give a feeling of restfulness and dignity; broken jerky lines cause confusion. A definite horizontal line along a wall, created by, for instance, level-topped furniture or a group of pictures, makes a room look longer and lower. The skilful use of line can thus help to improve the appearance of a badly-proportioned room. The frequent use of vertical lines, as in full-length straight curtains, up-and-down striped wallpaper, and tall thin pieces of furniture such as high-backed dining chairs will give an impression of added height.

Form should be related to use and materials.

The form of an object is usually the most obvious thing about it, and good form is a combination of simplicity, functionalism, and honesty in the use of materials. For example, an earthenware teapot should not be cumbered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Rats have caused plagues and fires, and today in New Zealand they are piling up a huge bill for damage. A pair of rats can, in 3 years breed a progeny of 259,000,000. There are millions of rats in this country and they are increasing.
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Keep all food and waste in rat-proof containers. Remove all rubbish from the yard. Fill rat burrows with concrete which incorporates broken glass. Scatter powdered glass along the rat run-way. Keep changing your methods. Use dogs and cats, or traps, or poison (e.g. barium carbonate or one of the newer poisons.) Fumigation may be necessary where burrowing is extensive. Consult your local authority; they will advise you further.
Don't let up. The loathsome Rat is eating into your money and health. FIGHT TO KILL.
KEEP THIS ANNOUNCEMENT FOR FUTURE REFERENCE.
FOR A HEALTHIER NATION

up with unnecessary protuberances and ornate decorations, it should be easy to pour from and empty, and it should be curved, not angular. The same rules apply even more forcibly to larger articles. Chairs are meant to be sat in, so the seats should be low enough for ease, but not so low that it is almost impossible to get out of them; backs should be of the right height, and without uncomfortable bumps. Metal furniture and ornaments can be in shapes which would be torture for wood; glass and plastics have their own special strengths and weaknesses.

Good proportions in the relations between breadth and height, solid and space, are extremely important in creating articles which look just right. The development of the telephone provides a very good illustration of the slow evolution of a satisfactory and satisfying article in common use.

Pattern

Pattern is one of the most abused of these art elements. This is often because "pattern" is obscured by the more obvious "colour." Many people are satisfied with articles so long as the colours match, and remain unconcerned about violent clashes of pattern. It is, for example, not uncommon to see rooms with diagonal patterned wallpaper, polka dotted curtains, heavily flowered upholstery, and a geometric carpet, or some equally eye-rending combination. Some modern rooms have no pattern at all, but if

Conflict of pattern is disturbing.

not composed very carefully they look drab. Pattern adds interest to a room but too much is distracting—about one-third patterned surface to two-thirds plain is a safe proportion to use as a guide.

It is a help in avoiding such conflicts to think of patterns in three different groups: **Naturalistic** patterns are really like pictures of the thing they represent—trees complete to the last leaf, for example, such as are sometimes found in printed chintzes. The same tree may be used for a **conventionalised** pattern, in which, instead of a picture of a tree, there is a tree motif—curves are smoothed out, colours and forms modified, branches perhaps intertwined to make

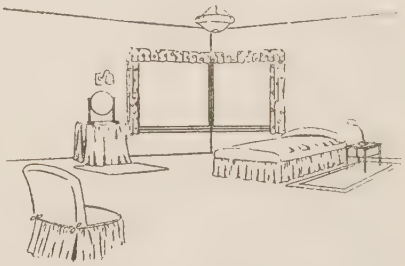
a formal design. Finally, in an **abstract** pattern the tree as a tree disappears, and there remain only lines, colours, and masses arranged in a certain way; to the observer they may suggest a tree or some other definite object, they may appeal as a pleasant collection of shapes and colours, or they may be regarded with disapproval as a meaningless set of lines and blobs. Each of these pattern groups has its own place in decorating, and its own appeal.

Texture, Light, and Colour

Texture, too, is often overlooked or not used to the best advantage. There are smooth, silky textures and rough, harsh ones. All the variations of surface finish—rough, smooth, coarse, fine, soft, hard, polished, dull—determine the texture of an article, and textures, no less than colours and patterns, should be harmonised—for instance satins rather than cottage weaves are suitable with glossy polished woods.

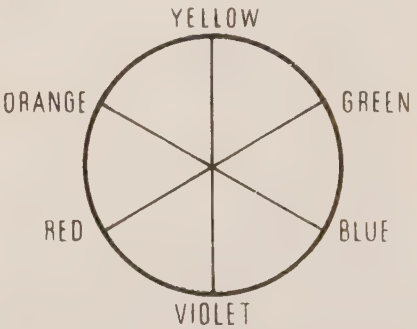
The texture of a surface influences the way light is reflected from it and hence affects the colour of the object. Blue woollen material and blue silk would never look quite the same, even though the same dye were used.

Light, and especially the arrangement of artificial light, is very important in decorating. Lighting must be adequate, and it is essential that the materials and colours to be used in a room should be tried out in artificial light, as some colours, especially blues, change remarkably. Pale colours and shiny surfaces reflect light; dark colours and dull surfaces absorb it. This should be remembered in rooms where natural light is poor. No greyed tones should be used in such rooms; clear, bright colours are much better. Light shining through coloured curtains, or reflected from a green hedge just outside the window, may change the appearance of colours used inside the room.



Rooms should have good natural and artificial lighting.

Colour has been left to the last in this list because it usually receives more attention than the previous items. Colour has a universal appeal, and for that reason there is a tendency to concentrate on colour and a feeling that if the colour scheme is carefully chosen the room is right. But all the other art elements must be considered too.



Choice of colour is important. This shows how the main colours are related.

Line, form, pattern, texture, light, and colour, then, are the basic ingredients which must be combined by the home decorator to produce harmonious rooms which suit their owners. It is not possible to write recipes, of coures, but in later articles these things will be explained more fully. The furnishing of different rooms and special problems like windows and loose covers will be discussed.

And, in the meantime, try looking at rooms to see how they have been put together and begin your collection of ideas and samples.

Rural Housing Survey

BEFORE more efficient plans for rural houses can be prepared the special needs of farm families must be known more accurately. The Rural Sociology Section of the Department of Agriculture has planned a survey of rural housing to obtain accurate information about present conditions, particularly the age, size, and type of farm houses and their conveniences. At the same time questions are asked about housing preferences, so that women in particular will have an opportunity of saying what they have found most unsatisfactory in previous planning of farm houses and what features they consider most necessary for comfort and ease of work.

The information is being sought so that the general condition of farm houses may be known more accurately and an instructional service inaugurated providing farm families with plans for the improvement of standard types of old houses and for new houses to suit farm and family requirements. A summary of the results of the survey, and the instructional service plans, will be published in the "Journal of Agriculture," and co-operation in the survey will be greatly appreciated. Individual information supplied is, of course, confidential.

Fill in the application form for a questionnaire below and post it to the Rural Sociologist for your district.

The Rural Sociologists will also answer enquiries from country women about nutrition, preparation and preserving of food, and home management generally. Make use of this service.

North Auckland and Auckland:	Rural Sociologist, Department of Agriculture, AUCKLAND.
Taranaki, Wellington, Hawke's Bay, Gisborne, Nelson, and Marlborough:	Rural Sociologist, Department of Agriculture, WELLINGTON.
Canterbury, Westland, Otago, and Southland:	Rural Sociologist, Department of Agriculture, CHRISTCHURCH.

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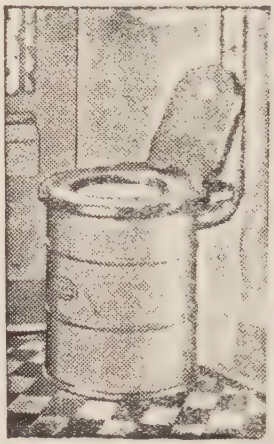

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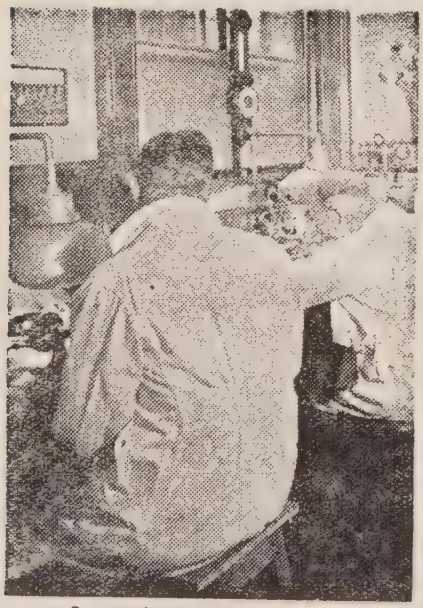

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29.6

"Where I Should Like to Live"

ONLY a very small proportion of readers expressed the desire to live in some other part of the globe—the majority indicated their preference for New Zealand and the particular locality in which they reside.

The first prize was awarded to "Rosemary," Levin, and the second prize to "Salt Bush," South Canterbury. Highly commended: "Moon Maiden," Hawera, and "London Pride," Ashburton.

First Prize

WHERE I would like to live—what a vivid series of day dreams those words evoke! Some of the beautiful places I have visited flash across my mind and I realise how intensely happy I could be living in such surroundings, for as Keats said, "A thing of beauty is a joy for ever." I recall the rolling Downs of southern England, gentle Devon with its red earth and purple heather-covered moors, villages in the Austrian Tyrol so perfect in their setting of mountain and lake and dark fir trees, coastal towns of South Africa alive with colour, peaceful coral isles with softly waving coconut palms and tropical paradises brilliant with flaming flamboyant blooms. And in New Zealand itself richly blessed with natural beauty and one of the happiest lands at the present time, the variety is just as great.

The choice is difficult. The desire to live in some of those interesting cities of the world with one's finger on the pulse of life or in some tiny village "far from the madding crowd" is very strong. But in spite of all their attractions and after much thought, I decide that here, where I live now, is my final choice.

Levin, a small thriving town in the Horowhenua district with its background of Maori legend and history, is set between the Tasman and the Tararua Mountains—mountains thickly clad with bush and scrub where the wild pig and deer abound, mountains that reflect the red-gold hues of sunset and whose snow-capped summits are etched sharply against the clear sky in winter, and at which I never tire of looking, so lovely are their outline and colour.

We are six miles from the Tasman and the expansive beaches of the west coast, where the sands are so wide and firm that one can drive a car for miles along the water's edge. What happy hours we have spent here, hunting for toheroas, gathering driftwood, bathing, or maybe best of all merely lying in the sun idly watching the breakers as they rush in, pause, and crash, spreading ever-widening carpets of creamy sea foam at one's feet.

But perhaps it is the intimate personal ties that make this choice inevitable. The small house, brightly painted and surrounded with flowers, the house that my husband and I

watched being built with such joy while our first baby was expected, the paths where my little son first learned to ride his tricycle, my small daughter push her dollies' pram . . . memory's garden blooms so profusely here.

—"Rosemary," Levin.

Second Prize

HOW many of us are in that privileged position to live just where we should really like to? Were I one of those extremely fortunate mortals I should not be "wintering" in New Zealand rolled up in many cardigans till I resemble an Eskimo in full winter dress. I should return to sunny Australia—not to the city to dwell in a luxury flat, but to the "outback" where I spent a very pleasant time years ago. The call of the bush has never quite left me, and the desire to return there still lingers.

I still see very vividly that large rambling homestead with its wide welcoming verandah where we all seemed to gather from all quarters, as if drawn by a magnet, for morning and afternoon teas, and a brief sociable chat. Thank goodness tea was not rationed then!

Beautiful pepper trees surrounded the homestead enclosure. They were exceptionally fine specimens, and in the season were a gorgeous picture with their long bunches of bright coral pink berries. From the verandah there was a long-range view far out over the vast plains that seemed to push time and space aside, broken only here and there by an occasional clump of bush which throughout the day became the meeting places for various flights of birds, for even though it was drought time, the air was alive with bird life. Dawn was welcomed by a mixed chorus, and throughout the day the air vibrated with the cheery songs of the magpies, the clatter of hundreds of peewits, the noisy meetings of flights of chattering and screaming gullaks mingled with the droll caw-caw of the wily crows as they stalked about the paddocks or watched where the industrious fowls laid their eggs. The most cheerful sound of all the bird chorus was the hearty laugh of the kookaburra who often sat for hours on the post at the end of the garden waiting and watching for crabs in the bore drain, and when rewarded by a catch would fly to a near-by tree and laugh heartily.

I wonder if those friends are still on the same station, and if the old homestead has been altered with the passing years? Many pleasant evenings we spent in the hot summer evenings on the verandah exchanging views and opinions on a wide range of topics, from everyday events to politics, haunted houses, and native superstitions, and wondering when the drought would break and bring the long-awaited relief to stock. Except for the anxiety caused by the prolonged drought an atmosphere of good cheer, peace and contentment reigned. Visitors were not frequent, but there was always the warm welcome that has made the Australian outback so noted for its open-hearted hospitality.

—"Salt Bush," South Canterbury.

Highly Commended

Breathes there the man with soul so dead
Who never to himself hath said,
This is my own, my native land!

I HAVE visited Australia, England, and most of the European countries, and have come to the conclusion that the brightest and happiest corner of this great world of ours is "God's own country." New Zealand's varied scenery and climate cater for all tastes, but the spot which attracts me most is Mount Maunganui. The Mount rises to a height of 1,000ft. and stands like a sentinel watching over the restless bar at the entrance to the harbour. A narrow stretch of land links the Mount with Tauranga in a semi-circular sweep, and at the end of this strip of land is Mount Maunganui. On the ocean side of the isthmus a surfing beach with white, glittering sand and foaming breakers stretches into the distance. This beach is famous for the beautiful deep sea shells which are washed up during storms, and it used to be the haunt of shell collectors before the spot became too well known to tourists.

On the harbour side, which at the closest point is separated from the ocean beach by two or three hundred yards only, there is a direct contrast. The beach is composed of iron sand and the water is calm and shallow. Fishing is good and varied—my brother once hauled a baby octopus to the surface, but I was horrified when I hooked a bag of drowned kittens! The ocean provides deep sea fishing, though the sea is usually too rough for the amateur fisherman.

From the summit of the Mount one gets a glorious view, and on a clear day White Island can be seen in the distance capped by a cloud of steam. The Mount itself can boast of a very bloodthirsty Maori history. In fact, there seems endless interest to be found in this place. Of course, it is a summer resort and I haven't yet wintered here, but residents say the cold months are peaceful and quiet and a welcome change after the gaiety of the summer. For variety of scenery and amusement I think this spot surpasses any I have yet seen, and so I choose it as the place where I would most like to live.

—"Moon Maiden," Hawera.

Competitions

SEPTEMBER

Essays describing "The View From My Window" will be received up to September 15.

OCTOBER

How often during recent years our hearts have been stirred by accounts of some of the heroic deeds performed by members of our Armed Forces. Yet war has no monopoly of bravery, and it is the less spectacular but equally courageous acts that have occurred in ordinary daily living of which I want you to write.

Entries close on October 15.

"A COURAGEOUS ACT."

First prize, 10/-; second prize, 5/-.

"MARY,"
"Journal of Agriculture,"
Box 3004, Wellington.

Highly Commended

I HAVE been fortunate enough to live in quite a few places. Six happy school years in U.S.A.—a truly wonderful country where youth is catered for to the "nth" degree. A while in dear old London, my birthplace, a city for which my poor pen cannot find suitable adjectives; even the name fills me with a certain nostalgia and a deep affection. A year or two in the heart of the English countryside—I can conjure up the loveliness of that spot even now and appreciate it far more than in my athletic-minded youth.

So now, having spent my younger life in travelling and moving every few years, I am "dug in" on a New Zealand farm, and without hesitation I choose this life. The satisfaction in sharing elementary things; the joy of seeing growing things and watching the cycle of the seasons, be they difficult or posperous; the peacefulness and ability to find solitude; the excitement of a trip to town and the pleasure of homecoming—all these things and many others make for me the life I would not willingly change, and this the best place in which to live.

—"London Pride," Ashburton.

WOULD we be so much happier elsewhere could we be spirited to the spot of our choice? True, we all tire of our surroundings at times, yet if we take a holiday we invariably reply, "Yes, I enjoyed it, but I am glad to get back home again." The happiest place to live, be it town or country, is where we are known, and have earned the good fellowship and respect of our neighbours throughout the years.

—"Knit-wit," North Canterbury.

TASMANIA'S NATIONAL PARK

By "Late Comer," Feilding.

SOME years ago during a holiday at National Park, Tasmania, a friend and I spent a week at the Osmiridium Fields 25 miles back in the bush. We packed our haversacks with necessities, donned riding gear and set off up the track to the accommodation hut at the top of the mountains . . .

GRADUALLY we left the bush behind and came out into tussock country. The trail was rather rocky and proved difficult for the horses. The ranger, who was to guide us on our tours of the Park, was waiting for us at the hut. He was the first man I had met who could neither read nor write. He was tall, spare, and of wiry build, and years of outdoor life had made him physically tough and strong, and possessing great powers of endurance. His was a gentle, kindly nature and he really loved the cold wilderness and the wild animals he protected.

Bath in a Blizzard

The hut had one large, bare room with long trestle tables and an enormous fireplace. Off this main room were two or three smaller ones and a bathroom. Oh, that bathroom! It was at the corner of the building and the corner was not a neat angle, but partly a jagged slit. I can remember having a bath while a blizzard howled outside, and as I sat in the steaming water the snow piled in through the cracks and icy draughts chased each other up and down my back. At night my friend and I slept under opossum skin rugs on stretchers drawn up in front of a blazing fire.

We explored as much of the Park as possible on horseback, but when the horses could go no further we tethered them and proceeded on foot. Many times we imagined we had reached exhaustion point, before we finally learned the trick of rhythmical, unhurried gait which the ranger kept up hour after hour, uphill and down, over rough ground and smooth. It was easier for me, having been reared on New Zealand hills, but my friend was city bred and such exercise was new to her. However, she was game and by keeping her between us so that she could not lag behind, we made good time.

The hut was built beside the largest lake in the Park and one day we rowed to the far end for a picnic

lunch. We lazed on the beach in the lee of some rocks, enjoying the occasional sunshine and grateful for our rock-shelter during brief squalls of rain and sleet. The weather was very uncertain and we could never go out without our slickers to protect us from wind, snow, or rain.

Rugged Country

Another memorable day we took our horses and skirted the lake, picking our way over the extensive swamp beyond, where the path was marked by tall poles—reminders of the time when all the Park would be deep in snow. We descended into a valley by a rough trail which was more like a staircase than a track. Our objective was a low mountain some miles down the valley. (Perhaps I should explain that National Park is really a plateau on which are a number of mountains. Although these mountains do not rise very high above the floor of the plateau they are thousands of feet above sea level. At its western edge the plateau ends in a sheer drop of thousands of feet to the forest country that stretches as far as the eye can see. This forms the western part of Tasmania. The plateau is further cut up by valleys, some shallow and broad like the one we were crossing, others unexpectedly deep with bottomless glacier lakes at the foot of the precipices. Scattered all over the area

were numerous shallow tarns too small to be called lakes. The horses had to be left a short distance down the valley as the ground was unsafe for them. Walking proved anything but easy. The surface was covered with rocks, water, and a coarse, tough shrub which crawled everywhere and did not break to release entangled feet. We had to be constantly ready for the jolt that came when our feet missed the rock under the scrub and splashed into icy water. In time we became adept at the game, learning to recognise the traps and choose places that would give us a sure footing. Eventually we climbed through the scrub to the summit of the mountain and then rested for a short period.

Race Against Time

We had to get back to our horses before dark or else we would have had to spend the night in that cold, rocky wasteland. Now began the race against time. The ranger lengthened his stride and we had to keep up with him as best we could. We did not complain for we knew that it was the only way to regain shelter and warmth for the night. Once with the horses we were safe as we could trust them to get us home when the light failed. We made only one stop. The ranger's keen eyes had seen the pricked ears of some wallabies under some shrubs and he hoped we might be able to go close enough to see the animals.

The dusk was thickening as we reached the horses. We ate our sandwiches hurriedly, then mounted and rode as fast as possible over the

rough ground. As the more experienced rider I was given the leader horse, Jack. We led the way up the staircase, while the ranger literally swung himself up by the tail of the second horse. It was dark at the top and there was still the swamp to cross. "Just give Jack his head and he'll take us home," said the ranger. The other horse followed with his nose on Jack's rump and the ranger had hold of his tail. Across the swamp and round the side of the lake we went. We seemed to ride continuously into a wall of darkness, with only Jack's intelligence to guide us, and no sound but the clop-clop of the horses' hooves. How glad we were to see the dim shape of the hut as we came out on to flat ground, and how we enjoyed our meal round the blazing fire that night.

Desolate Place

We made another trip on foot to the distant edge of the Park. This time we had fallen snow to deal with and care had to be taken when descending the rocky slopes which were partly snow-covered. A slip would have meant a twisted ankle or a broken leg, a disaster, indeed, in that desolate place.

We reached the end of our trail in the early afternoon. By that time a half-gale was blowing and there was a thick driving mist. We could not see where we were going, but the ranger knew the way. Out of the mist looomed a small heap of stones. Carefully the ranger piloted us round the cairn, hugging its sides. He was a man of few words, having grown used to silence during his long years in the mountains, and he did not offer any explanation, but drew us back close against the cairn and held us there firmly while the wind whistled and roared above our heads, and the mist rolled and billowed in front of us.

We waited, and presently there came a break in the mist and we saw that we stood at the edge of a precipice. Thousands of feet below us was the forest, the huge trees looking no bigger than grasses. The rent in the mist widened, allowing us a sight of the great expanse of wild country, range upon range stretching into the distance. Carefully we edged ourselves down from our dangerous position.

I was glad to move back and relax on the ground, but the other two amused themselves by rolling rocks down the huge cleft in the precipice which formed the jutting point whereon the cairn had been built by convicts long ago.

The walk home was as exhilarating as any I had experienced. We lost the mist and the wind when we descended to the lower levels and the rest of the trip was made in brilliant sunshine.

When we left the Park we sought some way of expressing our appreciation of the ranger's kindness. What could we give a man who lived in the wilds and could neither read nor write? Knowing that he had a gramophone and was fond of music, we bought a selection of records in Hobart and sent them to him. I hope he had as much pleasure from them as we derived from our memorable holiday in Tasmania's National Park.

Three Hours' Leisure

IT is Sunday afternoon. Our visitors left yesterday and the family are out. There's been much coming and going for the past month, and I feel in need of a little time in which to think over some of the questions we have discussed so wholeheartedly. Many and varied were the subjects "up for an airing"—we threshed them all out, to our own satisfaction, anyway.

And now I have three whole hours in which to do nothing—no tea to get, and no one to claim my attention in any shape or form. My book, by a very chatty man who writes of birds and men and events, all in one breath, so to speak, is very soothing. I read, and doze, and wake again feeling thoroughly at ease with myself and free from all care. I watch some wee wax-eyes flit in and out among the branches of a nearby tree. Presently a fantail joins them in the hunt for insects, and for a while they are all very busy, but soon "Fanny" tires of the wax-eyes' company and flies close to where I am lying. She makes a dash at a spider hanging perilously from his thread, then swoops down so near that I can almost touch her. She takes off with an ease an air ace would envy, then comes back again after the poor spider, twittering and chirping all the while.

Rain is very near: the softest of mists is slowly coming down over the hills, and the air holds a curious quietness. In the distance the roar of the river and the roll of the sea become merged into one. A few birds call slowly and lingeringly; the mists steal down lower and lower until the sky and faraway hills are hidden from my sight. Even the wax-eyes and "Fanny" have gone home. I feel as though I am suspended in space, with no real connection anywhere and therefore no duties—nothing but the bliss of being quiet and alone with the soft mists on the hills.—**"Jonathan."**

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Miniature Anthologies

I'VE been sharing treasures with "Autumn Tints." I sent her a poem which reminded her of a cherry tree she knew, and then I remembered a "wild cherry" poem and a tree that in spring is a white tent of loveliness; and so an idea of making miniature anthologies arrived! I've also planned a "mushroom" one, four poems coming to my notice within a short period, and now there'll be a "foxglove" one.

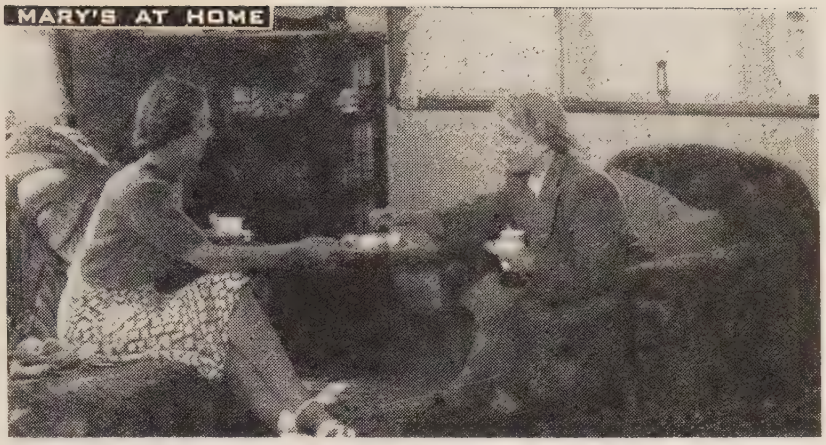
Ursula Bethell, a Christchurch poet who wrote under the name of Evelyn Hayes, died recently. I've had a slim green volume of her poems for many years — garden poems mostly, written about her acre on the Cashmere Hills. Here is her poem, "Fuchsias"—favourite of them all. I'm sure it will make you want a fuchsia corner in your garden.

" . . . You have not seen the present display of fashion
In our fuchsia row.

A coat of damask pink and an underrobe of crimson—
A rose-red polonaise and a petunia petticoat—
An ivory-white wimple and a purple habit—
A plum-coloured paletot and scarlet pantaloons—
It is prodigious!

These elegant persons like a little morning sunshine,
But shaded seclusion on sultry afternoons;
They are sheltered therefore by the south wall of our dwelling
And are admired by visitors approaching our door."

—"Tinkle Tinkle," Dunedin.



IF I may be accepted as a "Good Neighbour," perhaps I could use the pen-name of "Njiniwa" (pronounced "Newniwa") which is my own name in the language of the Pitjanjatjara tribe of aborigines.—**"Njiniwa," Victoria, Australia.**

WHEN the duck-shooting season commenced there was a great commotion of guns round the coast of the Arapuni Lake, especially on the first morning. Dad made some decoys, painted them with tar, and stuck some black fowl feathers on them. They looked so like real ducks that when one got loose, unknown to him, and he saw it floating out on the lake, he fired at it!—**"Bella Rob," Putaruru.**

MY brother and his wife recently made a pilgrimage to Mt. Cook and sent us the most beautiful photo of the peak. In the foreground delicate birches and leafless larches cast their spindly shadows on the snow. I appreciated the picture, but it did make me want to view the original. I hope that a trip to the South Island may materialise for me some day when my boy's schooling is completed. —**"E.W.," Waiheke.**

Advance Showing

Although the calendar says May,
I glimpsed the gown of Spring today—
Imprisoned behind plate glass,
Beyond the touch of those who pass
Were anemones and daffodils,
Violets and bunch-jonquils.
It very nearly broke my heart
That Spring should be a thing apart,
Hastened on by glass and heat—
She should come on dancing feet
With her apron full of flowers,
Acquainted with the sun and showers.
Bulbs and hyacinths should know
The soft blanket of the snow,
Violets feel the kiss of rain
And blossom to a wind's refrain.
Spring should come with slow surprise
To delight our winter-weary eyes.

—**"Tinkle Tinkle," Dunedin.**

"The life that is deep and strong in all its inner loyalties and aspirations is always the life that silently moulds and fashions others into its own most beautiful form."

—**"Clara Jane," Rakaia.**

I'D like to say how much I enjoy your pages in the "Journal" every month—the magazine can't come quickly enough for me. We generally receive our mail twice a week, brought by the kindly grocer's boy

just at dinner time, and everyone has to admire the new pictorial cover. I've never written before, as my family keeps me busily and happily content. —**"Binks," Canterbury.**

ENCOURAGED by many newcomers appearing in print in your welcome pages, I, too, would like to join your happy circle. I would especially like to say how appealing are the lovely scenes which appear in your section. We have been receiving the "Journal" for many years now and I think your pages improve with each issue. My husband has fixed up the subscription till 1950, so I am looking forward to reading many more copies! I also would like to say how interesting and instructive are the articles written by Mrs. Topping.—**"Lumina," Kaikoura.**

AFTER perusing the valuable articles on food values, sewing, handiwork, etc., which have appeared lately I wonder more than ever what has become of our intelligence that homemaking has such a back seat. Mothers must encourage girls in all homecrafts, foster a working knowledge, if not an outstanding proficiency, in these things, and fathers must not grumble if, in the learning thereof, a little expense is incurred by the beginners. Children should learn and profit by these experiments and not be allowed to grow up ignorant of the rudiments of simple living. —**"Glorianna," Hamilton.**

ST. TERESA'S BOOKMARK

Let nothing disturb thee,
Nothing affright thee,
Everything passeth, God is unchanging.
He who has patience
Everything comes to him.
He who has God
He lacks for nothing—
God only suffices.

—Sent in by **"Caradon," Waikato.**

"A GIRL cannot take any credit for her beauty at sixteen, but the beauty of a woman of sixty is her own soul's doing."—**"Clara Jane," Rakaia.**

YOUR letter on pot pourri awakened memories of my youth, as my mother kept a jar on a large Scotch chest in her room. The chest itself was a thing of beauty, the drawers being panelled in various New Zealand woods chosen for their beauty of grain and colouring, and shining with a high polish. The pot pourri consisted mainly of rose petals and fragrant spices, and the container was an old tobacco jar shaped like a barrel and

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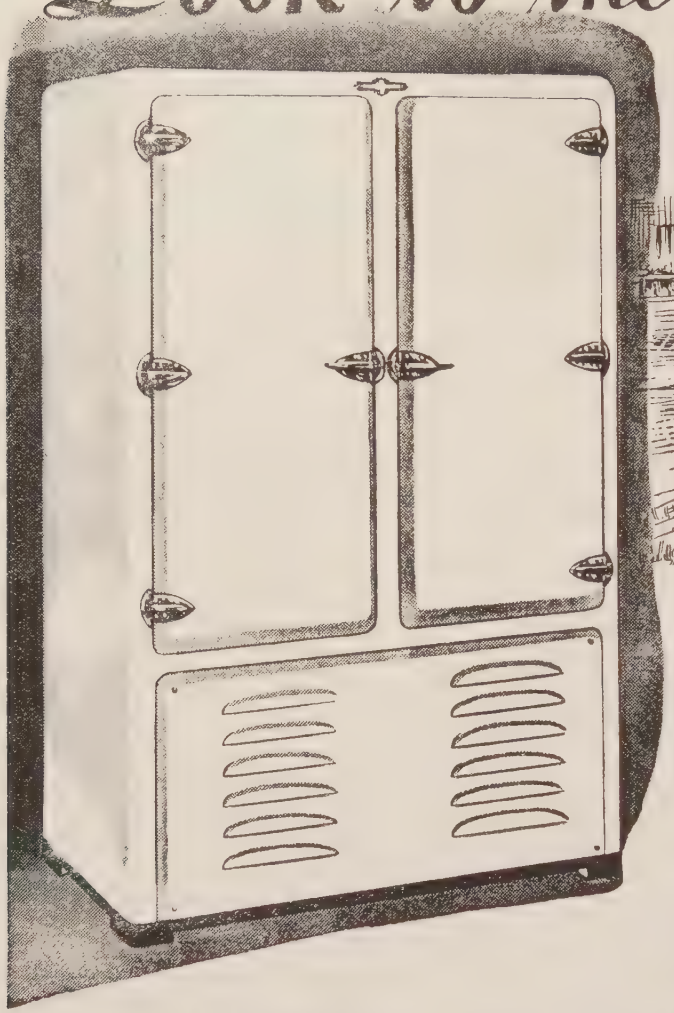

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standing about nine inches high. It was in shades of buff and brown and depicted arboreal scenes.—**"Willwin," Matamata.**

HUMOUR and tolerance seem to rank as the greatest attributes in "Good Neighbours," so far as one can judge by your pages, Mary.—**"Mote," Kerikeri.**

PERHAPS some of the "Good Neighbours" will be interested in a book I am making of Mary's pages. In a large exercise book I paste the picture and Mary's message, and on the opposite page verses, thoughts, or extracts from books bearing on Mary's subject. It is surprising how many treasured quotations one can collect thus. The book is precious to me and seems to help me anew each time I refer to it. Here is one of the poems I have copied into the book:

THE HOUSE BEAUTIFUL

Where there is Faith
There is Love.
Where there is Love
There is Peace.
Where there is Peace
There is God.
Where there is God
There is no need.

—"Caradon," Waikato.

DO you remember the bells on the January cover of the "Journal"? Last summer was so dry and the ground so brown and parched that we had to carry water and put up with many inconveniences. I'm afraid our tempers suffered in consequence. The largest bell, with "Peace" inscribed on it, seemed to bear a mute reproach, so I cut it out and hung it in a prominent position. Many a time when I've just been going to snap someone's head off, I've caught sight of it, and its message of one word has helped to preserve good temper and harmony in our home.

—"Susan," Kamo.

I HAD a crowd of visitors yesterday, so I thought I would make a steamed pudding for dinner. I put it on the stove at 6.30 in the morning and at 9.45 I had a look at it and was alarmed to see no steam rising from the pot. Then it suddenly dawned on me—the power was off! It goes off here every day for an hour, and I had forgotten all about it when I put the

pudding on. The pudding recipe stipulated: "Must not go off the boil. Cook for 4 hours." Poor pudding, or should I say, poor ducks, as they finished it off out in the paddock.—**"Romulea," Upper Hutt.**

WHEN I lived in the country I used to go for long walks and then come home and write about the things I had seen. Nobody ever saw what I wrote, but I was probably the better for having exercised my powers of expression. My garden is now gay with chrysanthemums—the scent of them intoxicates me. I wonder if any reader would like me to pass on my copy of "Wild Life" which I receive regularly from Australia. It is a monthly publication full of interesting data about plant, bird, and animal life.—**"Native Flower," Waipukurau.**

I FELT very sorry for "Good Neighbours" in the bushfire areas. Unless one has experienced the loss of home and belongings in a fire one can hardly realise what a complete misfortune it is when all one's treasures are no more. Here, smoke was the only nuisance, though scrub fires were a menace.—**"Tiggetty Boo," Kati Kati.**

MAY I join your "Good Neighbour" circle? I always enjoy reading your section and often take up the "Journal" to re-read some article which has appealed to me. I would like to have "Turquoise" for my pen-name, as it is not only my favourite stone but also my favourite colour and associated with many of my childhood memories.—**"Turquoise," Okahukura.**

"EL Azir's" paragraph recalled to mind the joy that was mine concerning my first experience with a monarch butterfly. It came into my garden and settled upon a zinnia flower in company with a large bumble bee. It paid no attention to the bee nor showed any fear of me. Later I watched it fly round my swan plants, alighting occasionally to leave a tiny egg under a leaf. I looked at those tiny specks every day—it was wonderful to watch them go through the many changes which transformed them into glorious butterflies. One became a real pet, as it was born with a wing crumpled and useless, and it could not fly. Every day for many weeks I fed it with sugar and water in a teaspoon. It would rest upon my hand, uncurl its feeder, and search all round the spoon for the food; and at night it slept upon the curtain or rested on a plant that was kept in the window.—**"D.M.," Waikato.**

HOT cross buns, or manna from heaven—it was all one to the seagulls when small son was left in the back of the car with some packages while mother foraged in the shops nearby for supplies to last over Easter. First of all he threw one bun out and down swooped a seagull. Sonny boy liked the sight, so continued with his distribution of buns. Soon the car

was surrounded by screaming gulls and passing motorists slowed up to enjoy the fun. Poor mother! not a single bun was left out of nearly three dozen, and even the bag was thrown out to finish off the feast.—**"Deputy Mum," Waikato.**

TRIBUTE FROM A TOMCAT

WE never expected to get into print, Missus and I. Why, neither of us can even spell! We were both thrilled, of course. Rabbit catching is more in my line and a very hush-hush expedition against birds now and then. How about a freshly-killed mouse? Would you appreciate one? I would love to oblige you.

—(Signed) Tomcat ("Wild Country's"), Te Pahu.

INFANTILE PARALYSIS

THE chances are that you and your neighbours have at some time had infantile paralysis and you have not known a thing about it, or at least, it has not been recognised as infantile paralysis, writes an officer of the Department of Health. Nevertheless, the little germ that causes it has attacked you. It is more than likely that the only noticeable effect has been a slight touch of influenza or perhaps an off-colour feeling for a day or two.

Why then do some people have the paralysis, and others apparently escape it? Actually, they do not escape it; they have it so mildly that it leaves no ill effects. But why does the virus kill or cripple one or two children in a thousand, while the rest throw it off without damage? This is one of the riddles that medical science has still to answer.

Individual resistance to disease and individual susceptibility to infection are still unsolved mysteries. Until they are solved, infantile paralysis will continue to do its damage to the unlucky few.

Research on this disease has led to changed viewpoints. In the past the causal viruses were thought to be spread by droplets emitted from the mouth during speech or in coughs and sneezes. Post-mortem research showed no signs of damage in those parts of the brain dealing with smell, though the virus was supposed to travel up the nerves of smell. The virus is found in the mouth and throat region, the lining of the small intestine, and in the motor mechanisms of the brain and spinal cord.

The new view is that infantile paralysis is a virus-caused disease infecting the intestine, and possibly the throat. In most people there are no symptoms, as the virus is expelled from the body; but in those unlucky people the virus spreads along the nerves from the throat or intestine to the spinal cord and causes paralysis.

In a recent epidemic in certain parts of New Zealand the correct practice of attempting to stop the spread of the virus was adopted.

Children are the victims as a rule, so where infantile paralysis becomes epidemic they must be prevented from gathering together. They should be made to wash their hands frequently during the day and always before eating food. Flies must be kept from all foodstuffs, and general cleanliness of bodies and households must be scrupulously maintained.

Infantile paralysis is one of our most terrifying diseases. It terrifies because it cripples and kills. The way to think of it is to compare it with measles. Many people have mild attacks of measles, but very few suffer from the kidney complications. When an epidemic of infantile paralysis is recognised, it has already been infecting thousands of the population in a mild way, and only occasionally finding a susceptible individual, usually a child, in whom actual paralysis develops. An American estimate considers that only one person out of every three thousand is ever likely to die of infantile paralysis, one out of a thousand will be paralysed, and one out of five hundred will have the disease in a recognisable form.

Infantile paralysis is one of those diseases for which parents should be on the constant lookout. The symptoms are very deceptive and the worst should be suspected until a diagnosis is obtained. If your child is drowsy, irritable, and feverish, suspect infantile paralysis. It may not be this disease, but there is a chance it may be. If your doctor knows in plenty of time, the patient's chances of getting better are immeasurably increased.

TABLE OF CONTENTS

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FEATHERED FRIENDS

I WAS very interested in the story of "Alleyne's" thrush which became so tame. One night our big cat brought in a lovely finch. The bird didn't seem to be badly mauled, so, as it was about 11 p.m., I put him in the canary's cage, very much to the latter's disgust. On examination next morning I found the finch had a fractured leg which I put in splints. It was funny seeing the canary's treatment of the interloper, his annoyance eventually causing him to despoil the finch of his tail, though the finch was twice his size. At the end of three weeks the leg had mended and the bird was able to stand and hop quite well on it. I released him and he flew to the top of the macrocarpa hedge where he preened himself for half an hour before flying away.—**"C.V.W.," Waverley.**

A SEAGULL used to perch on the posts of the fowl-run and wait for me to bring over the daily scraps, sometimes wheeling round me impatiently before alighting among the hens to search for food. Eventually the fowls began to accept him as one of themselves and I christened him **Bertram.** He wasn't able to keep his secret for long, because a few weeks later he was joined by another seagull —"Mrs. Bertram," I presume. At first she was a little wary of the proceedings, but soon lost her shyness and the two became a familiar sight as they perched side by side waiting for me. I was beginning to fear that they might introduce their friends, but fortunately the fowl-run was evidently a secret rendezvous.

—"Clara Jane," Rakaia.

"ALLEYNE'S" lovely little article on her pet thrush prompts me to tell of my pet—a sparrow! She was just a very tiny baby unable to fly properly when I found her at the Auckland Railway Station beating her little body against the hard concrete walls in an endeavour to get out into the air again. I picked her up and tried to quieten her fears. Eventually I procured an empty shoe box and cut it in half, making holes in the lid and then tying it securely after placing my newly-found sparrow therein.

At first I wondered whether poor little Teresa, as I christened her, would be able to stand the journey home, then I worried over what she would eat and whether we would ever be able to rear her, as I had heard that one cannot rear a wild bird. However, with our budgie in a nearby cage as a guide, Teresa has stood up to it all and is now an even greater pet than the budgie. Whereas our budgie does not enjoy coming out of his cage, she loves flying all around the kitchen and delights in landing on my head!

Teresa does all the things which "Alleyne's" thrush does, and simply loves her daily bath in a little pie-dish. She also delights in a dust bath, as a consequence of which the whole house seems always to be in a mess, as soil comes hurtling out of her cage at a great rate. She is quite a little trapeze artiste, too, jumping on her swing and working it up to a great speed, then jumping down on to her perch as quick as lightning before hopping back on to the fast-moving swing.

We have had her just over four months now and will probably give her her freedom in the spring. We hope she will come back, and think she may do so as she has a great pal in our budgie and loves to perch up on his cage.—**"Ruby Evelyn." Auckland.**

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And make the cart ruts beautiful.
—R. L. Stevenson.

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